



LASER CLASS RULES 2021



The Laser was conceived by Ian Bruce to be a moderately priced strict one design Class with the ideal that everyone should have the same equipment.

Production commenced in 1971 and it was adopted as an Olympic class in 1993.

The first Olympic Games with the Laser were held in Atlanta, USA 1996.

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INTRODUCTION

This introduction only provides an informal background and the International Laser Class Rules proper begin on the next page.

Laser hulls, hull appendages, rigs and sails are manufacturing controlled.

Laser hulls, hull appendages, rigs and sails shall only be manufactured by Laser Performance (in the class rules referred to as licensed manufacturers). Equipment is required to comply with the International Laser Building Specification (in the class rules referred to as the Laser Construction Manual and is subject to a ~~World Sailing approved manufacturing control system~~. ???

Laser hulls, hull appendages, rigs and sails may, after having left the manufacturer, only be altered to the extent permitted in Section C of the class rules.

Owners and crews should be aware that compliance with rules in Section C is NOT checked as part of the certification process.

Rules regulating the use of equipment during a race are contained in Section C of these class rules, in ERS Part I and in the Racing Rules of Sailing.

Note: Where the class permits IHC it should be mentioned here which items may be produced under IHC.

PLEASE REMEMBER:

THESE RULES ARE **CLOSED CLASS RULES** WHERE IF IT DOES NOT SPECIFICALLY SAY THAT YOU MAY – THEN YOU SHALL NOT.

COMPONENTS, AND THEIR USE, ARE DEFINED BY THEIR DESCRIPTION.

Section A – General

A.1 LANGUAGE

- A.1.1 The official language of the class is English and in case of dispute over translation the English text shall prevail.
- A.1.2 The word “shall” is mandatory and the word “may” is permissive.
- A.1.3 Except where used in headings, when a term is printed in “**bold**” the definition in the ERS applies and when a term is printed in “*italics*” the definition in the RRS applies.

A.2 ABBREVIATIONS

- A.2.1 WS World Sailing ***
- MNA Member National Authority
- ICA International ... Class Association
- NCA National Class Association
- ERS Equipment Rules of Sailing
- RRS Racing Rules of Sailing
- OSR Offshore Special Regulations

A.3 AUTHORITIES

- A.3.1 The international authority of the class is World Sailing which shall co-operate with the ICA in all matters concerning these **class rules**. ***
- A.3.2 Notwithstanding anything contained herein, the **certification authority** has the authority to withdraw a **certificate** and shall do so on the request of WS. ***

A.4 ADMINISTRATION OF THE CLASS

- A.4.1 WS has delegated its administrative functions of the class to MNAs. The MNA may delegate part or all of its functions, as stated in these **class rules**, to an NCA. ***
- A.4.2 In countries where there is no MNA, or the MNA does not wish to administrate the class, its administrative functions as stated in these **class rules** shall be carried out by the ICA which may delegate the administration to an NCA.

A.5 CLASS RULES CHANGES

- A.5.1 At Class Events – see RRS 89.1.d) – ISAF Regulation 26.5(f) applies. At all other events RRS 87 applies. ***

A.6 CLASS RULES AMENDMENTS

- A.6.1 Amendments to these **class rules** are subject to the approval of the WS in accordance with the WS Regulations. ***

A.7 CLASS RULES INTERPRETATION

- A.7.1 Interpretation of **class rules** shall be made in accordance with the WS Regulations. ***

A.8 INTERNATIONAL CLASS FEE AND ISAF BUILDING PLAQUE

- A.8.1 The licensed hull builder shall pay the International Class Fee.
- A.8.2 WS shall, after having received the International Class Fee for the hull, send the WS Building Plaque and a measurement form to the licensed hull builder. ***

A.9 SAIL NUMBERS

- A.9.1 Sail numbers shall be issued by the ICA.
- A.9.2 Sail numbers were issued in consecutive order starting at “101”.

Sail numbers of production Lasers are issued consecutively & began with 101.

Sail numbers: 001, 010 & 100 (binary numbers) were 3 Prototypes built in 1970.

Sail numbers: 101 (1971) – 148 199 (1993) (Performance Sailcraft 2000 issued HIN)

Sail numbers: 148 200 (1993) - (1996) (IYRU plaque)

Sail numbers: 1996 – 2015 (ISAF plaque)

Sail numbers: (2015) – 217 251 (2019) (World Sailing plaque)

Sail numbers: Hull/Sail number 217 252 (2020) onwards (The Laser Class plaque)



Figure 1 - Examples of the Class Legal Hull Plaques



The Laser Class hull plaque from: 218 256

A.9.3 Sail numbers shall correspond to the hull number.

A.10 HULL CERTIFICATION

A.10.1 A **certificate** shall record the following information:

- (a) Class
- (b) **Certification authority**
- (c) Sail number issued by the **certification authority**
- (d) Owner
- (e) Hull identification (*See the Guide to Standard Class Rules*)
- (f) Builder/Manufacturers details
- (g) Date of issue of initial **certificate**
- (h) Date of issue of **certificate**

A.11 INITIAL HULL CERTIFICATION

A.11.1 For a **certificate** to be issued to hull not previously **certified**:

- (a) **Certification control** shall be carried out by the **official measurer** who shall complete the appropriate documentation.
- (b) The documentation and **certification** fee, if required, shall be sent to the **certification authority**.
- (c) Upon receipt of a satisfactorily completed documentation and **certification** fee, if required, the **certification authority** may issue a **certificate**.

A.12 VALIDITY OF CERTIFICATE

A.12.1 A hull **certificate** becomes invalid upon:

- (a) the change to any items recorded on the hull **certificate** as required under A.11.
- (b) the date of expiry,
- (c) withdrawal by the **certification authority**,
- (d) the issue of a new **certificate**,

A.13 HULL RE-CERTIFICATION

A.13.1 The **certification authority** may issue a **certificate** to a previously certified **hull**:

- (a) when it is invalidated under A.13.1(a) or (b), after receipt of the old **certificate**, and **certification** fee if required.
- (b) when it is invalidated under A.13.1 (c), at its discretion.
- (c) in other cases, by application of the procedure in A.12.

A.14 RETENTION OF CERTIFICATION DOCUMENTATION

A.14.1 The **certification authority** shall:

- (a) retain the original documentation upon which the current **certificate** is based.
- (b) upon request, transfer this documentation to the new **certification authority** if the hull is exported.

Section B – Boat Eligibility

For a **boat** to be eligible for *racing*, it shall comply with the rules in this section.

B.1 CLASS RULES AND CERTIFICATION

B.1.1 The boat shall:

- (a) be in compliance with the **class rules**.
- (b) have a valid hull **certificate**.
- (c) have valid **certification marks** as required (See A.9.2 & Figure 1)

B.2 FLOTATION CHECKS

B.2.1 The hull **certificate** shall carry a satisfactorily flotation check confirmation.

B.2.2 A race committee may require that a **boat** shall pass a flotation test in accordance with Appendix ***

B.3 CLASS ASSOCIATION MARKINGS

B.3.1 A valid Class Association Sticker, if required by the NCA or the ICA, shall be affixed to the hull of the hull in a conspicuous position *** (TLC does not provide these?).

B.3.2 Sails shall carry a Class Association Sail Label. *** (button?)

PART II – REQUIREMENTS AND LIMITATIONS

The **crew** and the **boat** shall comply with the rules in Part II when *racing*. In case of conflict Section C shall prevail.

The rules in Part II are **closed class rules**. **Certification control** and **equipment inspection** shall be carried out in accordance with the ERS except where varied in this Part.

(The text “The rules in Part II are closed class rules” to be used if all Sections in Part II are closed class rules. Otherwise, it should be stated under “Rules” in each section whether the rules in that section are “closed class rules” or “open class rules”.)

Section C – Conditions for Racing

C.1 GENERAL

C.1.1 RULES

- (a) RRS ... shall not apply.
- (b) RRS ... is/are changed as follows: ...
- (c) The ERS Part I – Use of Equipment shall apply.
- (d) ERS ... is/are changed as follows: ...

C.2 CREW

C.2.1 LIMITATIONS

- (a) The **crew** shall consist of one person.
- (b) No **crew** member shall be substituted during an event.

C.2.2 WEIGHTS

- (a) There are no restrictions on crew weight.

C.3 PERSONAL EQUIPMENT

C.3.1 MANDATORY

- (a) The crew of each boat shall be equipped with a **personal floatation device** with the minimum standard ISO 12402-5 (CE 50 Newtons), or USCG Type III, or AUS PFD 1.

C.3.2 OPTIONAL

- (a) Hiking harnesses are not allowed.

C.3.3 TOTAL WEIGHT

- (a) The total weight of worn equipment shall not exceed:
 - (i) For a person sailing a standard or radial rigged boat: 9 kg
(Alteration of RRS 43.1)
 - (ii) For a person sailing a 4.7 rigged boat: 8kg (as stated in RRS 43.1)
- (b) Competitors shall not wear or carry deliberately weighted, non-floating clothing or equipment which in total weight exceeds 500 grams dead weight except protective sailing clothing. *** SHikers?

C.4 ADVERTISING

C.4.1 LIMITATIONS

Advertising shall only be displayed in accordance the WS Advertising Code. The sail window must not be obscured. (See ISAF Regulation 20) ***

C.5 PORTABLE EQUIPMENT

C.5.1 MANDATORY

- (a) None required.

C.5.2 OPTIONAL

- (1) A timing device, analogue or electronic, may be mounted on the hull, mast, boom &/or worn by the sailor.
- (2) One compass may be mounted on any part of the deck or the cockpit.
 - i) The hull cavity shall not be pierced by anything other than the fasteners.
 - ii) Compasses shall not be fitted to inspection hatches.
 - iii) An additional wrist mounted compass is permitted.
 - iv) Electronic, self-contained, digital compass using magnetic input only are permitted.
 - v) A timing device may be integrated with the compass.
 - vi) A compass or timing device must not be capable of displaying, delivering, transmitting, receiving, calculating, correlating or storing information about wind speed, wind direction, boat speed or boat position. Any use of electronic equipment not specifically allowed in the rules is prohibited unless the rules are modified by the sailing instructions.
- (3) A camera may be attached to the sailor or may be mounted on the boat if the hull cavity is not pierced by anything other than the fasteners.
- (4) The stowage of drinks bottles, food, safety or other equipment may be securely attached on the deck, in the cockpit or around the mast or boom using clips, ties or bags except that additional fastening points may not be created for this purpose.
- (5) Wind indicators, "tell tales", "woollies", "leach ribbons" or similar may be fitted by the sailor without restriction except that the sail shall not be cut or the buoyancy of the hull, mast or boom be impaired.
- (b) NOT FOR USE
 - (1) Electronic navigation devices may not be carried.
 - (2) Mobile Telephone may be carried but shall only be used for emergency purposes & not for tracking. ***

C.6 BOAT

C.6.1 MODIFICATIONS, MAINTENANCE AND REPAIR

- (a) No modifications are allowed.
- (b) Maintenance in order to keep the boat in race worth condition is allowed.
- (c) Bona fide repairs are allowed.

C.6.3 WEIGHT

The weight is the weight of the hull in a dry condition & shall only include the fittings as supplied by the builder.

C.6.4 CORRECTOR WEIGHTS – NOT APPLICABLE.

C.6.5 FLOTATION

- (a) The **hull** shall be fully decked and have flotation elements.
- (b) Fully decked **hulls** shall comply with ISO 11812 and ISO 12216. ***

- (c) Flotation elements shall comply with ISO 12217-3 Annex C. ***
- (d) ~~Hulls with air tank(s) as flotation element(s) shall additionally comply with ISO 12217-3 Annex D, by test or calculation, except that the largest air tank shall not be included as a flotation element. ***~~

C.7 HULL

C.7.1 MODIFICATIONS, MAINTENANCE AND REPAIR

- (a) No modifications are allowed.
- (b) Maintenance in order to keep the boat in race worth condition is allowed.
- (c) Bona fide repairs are allowed.

C.7.2 FITTINGS

- (a) USE
- (1) Drainage plugs shall be kept in place at all times whilst afloat.
 - (2) Inspection hatch covers shall be kept in place whilst racing.

C.7.3 LIMITATIONS

- (a) ??? ***

C.8 HULL APPENDAGES

C.8.1 MODIFICATIONS, MAINTENANCE AND REPAIR

- (a) No modifications are allowed.
- (b) Maintenance in order to keep the boat in race worth condition is allowed.
- (c) Bona fide repairs are allowed.

C.8.2 FITTINGS

- (a) USE
- (1) The Centreboard stop shall be in place whilst racing.

C.8.3 LIMITATIONS

- (a) Only one **centreboard** and one **rudder** blade shall be used during an event of less than seven consecutive days, except when a **hull appendage** has been lost or damaged beyond repair.
- (b)

C.8.4 KEEL/CENTREBOARD

- (a) DIMENSIONS

	minimum	maximum
Maximum projection from the bottom of the hull	mm	mm 680mm

- (b) USE

- (1) The **centreboard** shall have a stop in place.
- (2) The centreboard shall have a retaining line.

The retaining line shall:

- i) Attach the centreboard to the boat.
- ii) Maintain the centreboard in the centreboard case. ***

C.8.5 RUDDER

(a) DIMENSIONS

	minimum	maximum
Maximum projection from the bottom of the hull	mm	mm 515mm

(b) USE

- (1) The rudder blade shall be in its fully lowered position. However, for races sailed in shallow water the sailing instructions may prescribe that this rule shall not apply.
- (2) The Rudder shall have a retaining line, clip or pin in addition to the hull rudder retaining clip in order to further reduce the risk of the loss of the rudder.

C.9 RIG

C.9.1 MODIFICATIONS, MAINTENANCE AND REPAIR

- (a) No modifications are allowed.
- (b) Maintenance in order to keep the boat in race worth condition is allowed.
- (c) Bona fide repair are allowed.

C.9.2 FITTINGS

(a) USE

- (1) ??? ***

C.9.3 LIMITATIONS

- (a) Only one set of **spars** shall be used during an event, except when an item has been lost or damaged, and the race committee has approved the substitution. (** add seven days?)
- (b)

C.9.4 MAST

(a) DIMENSIONS

	minimum	maximum
	mm	mm
Laser Standard lower mast – length overall	-	2 865
Laser Radial lower mast – length overall	-	2 262
Laser 4.7 lower mast – length overall	-	1 810

(b) USE

- (1) The mast **spar** shall be stepped in the mast step without packing, shims, wedges, blocks or risers except for the wear strips defined in XXX. ***
- (2) The heel plug shall be in place.
- (3) The heel plug shall have a drain hole which shall not be sealed.

C.9.5 BOOM

(a) DIMENSIONS

	minimum	maximum
Laser Boom - length overall	mm -	mm 2 740

(b) USE

(1) The boom shall be attached to the mast using the gooseneck fitting whilst racing.

(2) The Vang shall be attached to the boom key plate whilst racing.

C.9.8 RUNNING RIGGING

(a) USE

(1) The Mainsheet:

(a) The mainsheet shall be a single line of uniform thickness "wear & tear" by use excepted.

(b) Whilst racing the mainsheet shall be rigged such that it passes through the lead block (mounted just aft of the centreboard case), through the block at the mid-point of the boom, through the boom's lead eye or webbing strap, through the block on the outboard end of the boom, through the larger of the traveller blocks & secured through the becket of the block at the outboard end of the boom.

(c) Whilst racing the "tail end" of the mainsheet shall have a knot to prevent it passing through the lead block which need not be at the very end of the mainsheet. This knot may secure the mainsheet to the base of the mainsheet lead block, the hiking strap or the hiking strap control system. There may be more than one knot.

(d) Whilst racing the mainsheet may be held either from the mainsheet lead block or from between the mainsheet lead block & the mainsheet block at the mid-point of the boom. For the purposes of tacking or gybing it may also be held by the parts between the traveller block & the block at the outboard end of the boom.

(2) A Traveller line shall be fitted:

(a) The traveller line shall be a single line of uniform thickness "wear & tear" excepted.

(b) The traveller line shall be rigged as a loop between the two fixed hull traveller eyes & carry the traveller block on the after side of that loop.

(c) The traveller line may be spliced or knotted at the load bearing end but if sliced the splice shall not extend through a traveller eye.

(d) The traveller line may be spliced or knotted at the "free end" to make it easier to grasp which may be a loop or eye but if sliced the splice shall not extend through a traveller eye. Plastic "shrink" tube may be used at the ends for purposes of neatness & good seamanship. A plastic ball may not be used.

(e) A knot may be used where the traveller line passes back through its load bearing eye but no attempt to use this knot to provide additional purchases shall be made.

(f) A spring, ball, tape or shrink tube may be used between the two blocks. (move this elsewhere?)



Figure 2 – "Standard" mainsheet block set & "Optional" mainsheet block set

(3) The Vang or kicking strap:

(a) Whilst racing the vang system shall be rigged between the boom key plate & the vang tang of the lower mast.

(b) The vang system shall be one of the following:

- (i) The original "Classic" system.
- (ii) The original "Classic" system with the additional of blocks, eyes & lines. The arrangement of these additional blocks, eyes and lines is "free" except that a maximum of two lines & seven "turning points" is allowed. In addition, a swivel may be introduced between the mast & lower assembly.
- iii) The Laser builder supplied "XD" system as manufactured by Harken.
- iv) The Laser builder supplied "Race" system as manufactured by Allen.
- v) The Laser builder supplied system as manufactured by Barton.

b) The vang system shall comply with the following:

- i) The maximum theoretical mechanical advantage allowed is 15:1.
- ii) The vang "key" may be straight or curved & a spare may be mounted ready for use. (In 2019 this component was upgraded to improve reliability with a curved shank & thickened flange.)
- iii) Earlier masts had a hole for a 3/16" (4.8 mm) clevis pin in the vang tang this may be drilled out to accept a ¼" (6.4mm) or 6mm clevis pin or bolt.
- iv) The vang lower assembly shall be directly attached to the vang tang by a clevis pin, shackle pin, bolt, or quick release pin.
- v) The primary line shall be of uniform thickness & may be knotted or spliced.
- vi) The secondary line shall be of uniform thickness & may be knotted or spliced. A handle may be formed by slicing, knotting or lacing the secondary line &/or by introducing a section of flexible plastic tube or tape.
- vii) The tail of the secondary line may be attached to the centreboard &/or to the tail of the Cunningham line and/or the tail of the outhaul.
- viii) The tail of the secondary line shall not have a shock cord attachment either internally or externally. It shall not be attached to the shock cord of the centreboard retention arrangement.
- ix) A piece of shock cord may be tied around the boom such that it can be slid into a position to hold the key into the boom key plate in order to prevent the loss of the upper assembly in the event of a primary line failure.
- x) Plastic "shrink" tube may be used at the rope ends for purposes of neatness & good seamanship.



Figure 3 - Class Legal Vang "Optional" Base Units, Harken, Allen & Barton.

(4) The Outhaul system:

(a) Whilst racing the outhaul system shall be rigged.

(b) The outhaul system shall be one of the following:

- (i) The original "Classic" system.
- (ii) The original "Classic" system with additional blocks, eyes & lines. The arrangement of these additional blocks, eyes & lines is "free" except that a maximum of two lines & six "turning points" is allowed.
- (iii) The Laser builder supplied "XD" system as manufactured by Harken.
- (iv) The Laser builder supplied "Race" system as manufactured by Allen.
- (v) The Laser builder supplied "XX" system as manufactured by Barton. (??? - Original plan was to have 3 options)
- (c) If a builder supplied system is fitted the block plate must use the original Cunningham eye fixing points.
- (d) If a builder supplied system is fitted the cleat plate must use the original Cunningham cleat fixing points.
- (e) The Maximum mechanical advantage gained shall be 8:1.
- (f) The maximum sheave diameter shall be 30mm.
- (g) Different blocks & cleats from different manufacturers may be substituted so long as the basic function is not changed.
- (h) The primary line shall be of uniform thickness & may be knotted or spliced. If the system consists of only one line then a handle may be formed by slicing, knotting or lacing the primary line &/or by introducing a section of flexible plastic tube.
- (j) The secondary line shall be of uniform thickness & may be knotted or spliced. A handle may be formed by slicing, knotting or lacing the secondary line &/or by introducing a section of flexible plastic tube.
- (k) If splices are used the splice shall not be made unduly long in order to serve another or secondary purpose.
- (l) The outhaul arrangement is "free" except that at least one part shall pass through the intended fairlead at the outboard end of the boom & the maximum purchase of 8:1 is not exceeded.
- (m) The primary line may be attached directly to the cringle in the clew of the sail, to the intended fairlead at the outboard end of the boom or onto any block, hook or shackle within the system including a quick release system or the builder supplied slide.
- (n) For the purpose of this rule a hard eye or thimble can be used in place of a block.
- (o) Blocks may be attached to the outhaul cleat on the boom.
- (p) Blocks may be attached at the gooseneck by line, shackles, hooks or bolts.
- (q) A shock cord retraction system may be part of the total outhaul system & may be attached to one of the blocks, hooks or shackles within the system the clew strap or the sail.
- (r) Rope loops and or shock cord may be tied around the control lines and/or boom in order to maintain the outhaul control lines close to the boom.
- (s) The cleat on the boom need not be part of the system but shall not be removed.

(9) The Cunningham / downhaul system.

(a) Whilst racing a Cunningham system shall be rigged.

(b) The Cunningham system shall be one of the following:

i) The original "Classic" system.

ii) The original "Classic" system may be modified with additional purchases which may be obtained using rope loops, "optional blocks" and using any of gooseneck fitting, mast tang, sail tack cringle, boom, shackle or swivel attaching vang cleat base to mast tang or "builder supplied" deck cleat base. The Maximum theoretical mechanical advantage gained shall be 8:1.

iii) The Laser builder supplied "XD" system as manufactured by Harken.

iv) The Laser builder supplied "Race" system as manufactured by Allen.

v) The Laser builder supplied "XX" system as manufactured by Barton. (??? - Original plan was to have 3 options)

(c) If a builder supplied system is fitted the block plate must use the original Cunningham eye fixing points.

(d) If a builder supplied system is fitted the cleat plate must use the original Cunningham cleat fixing points.

(e) The Maximum theoretical mechanical advantage gained shall be 8:1.

(f) The maximum sheave diameter shall be 30mm.

(g) Different blocks & cleats from different manufacturers may be substituted so long as the basic function is not changed.

(h) The primary line shall be of uniform thickness & may be knotted or spliced. If the system consists of only one line then a handle may be formed by slicing, knotting or lacing the primary line &/or by introducing a section of flexible plastic tube.

(i) The secondary line shall be of uniform thickness & may be knotted or spliced. A handle may be formed by slicing, knotting or lacing the secondary line &/or by introducing a section of flexible plastic tube.

(j) The primary line shall be securely attached to either the gooseneck, mast, mast tang, swivel or shackle used to attach the vang cleat block to the mast tang, the cunningham attachment point or a becket block attached to the cunningham attachment point on the "builder approved" vang.

(k) The cunningham primary line shall pass through the sail tack cringle as a moving line and must count as 2:1 in purchases.

(l) The secondary line may be secured to the mast, vang tang, cunningham attachment point on the "builder approved" vang.

The objective of these rules is to give sailors the option to tailor their boat to their requirements & to exercise their imagination as to how that might be achieved best for them but within the meaning & intention of these rules.

C.10 SAILS

C.10.1 MODIFICATIONS, MAINTENANCE AND REPAIR

- (a) No modifications are allowed.
- (b) Maintenance in order to keep the boat in race worth condition is allowed.
- (c) Bona fide repairs are allowed.

C.10.2 LIMITATIONS

- (a) Not more than one mainsail shall be carried aboard.
- (b) Not more than one mainsail may be used at an event of less seven consecutive days, except when a **sail** has been lost or damaged beyond repair.
- (c)

C.10.3 MAINSAIL

(a) IDENTIFICATION

~~The national letters and sail numbers shall comply with the RRS except where prescribed otherwise in these class rules.~~

~~(Not to be included here if this is covered in Section G and thereby checked in connection with certification control)~~

(b) USE

- (1) The **sail** is "sleeve luff" & the mast shall be inserted in the sleeve without spacers or packing.
- (2) The highest visible point of the **sail**, except for the webbing strap at the head of the sleeve luff, shall not be set above the top of the mast.

Section D – Hull

D.1 PARTS

D.1.1 MANDATORY

- (a) Hull shell, including centreboard case & transom.
- (b) Deck moulding, including bulkheads, cockpit floor & mast tube.
- (c) Buoyancy Tank (formed by bringing the hull shell & deck moulding together).
- (d) Flotation elements (included before bringing the hull shell & deck moulding together).

D.1.2 OPTIONAL

- (a) None

D.2 GENERAL

D.2.1 RULES

- (a) The **hull** shall comply with the **class rules** in force at the time of initial **certification**.

D.2.2 CERTIFICATION

See Rule A.13.

D.2.3 MODIFICATIONS, MAINTENANCE AND REPAIR

- (a) The hull shell, deck, bulkheads, double bottom mast step and transom shall not be altered in any way except as permitted by these **class rules**.
- (b) Holes not bigger than necessary for the installation of allowed optional equipment may be made in either the deck or hull.
- (c) Routine maintenance such as painting and polishing is permitted without re-measurement and re-**certification**.
- (d) If any hull moulding is repaired in any other way than described in D.2.3(c), an **official measurer** shall verify on the **certificate** that the external shape is the same as before the repair and that no substantial stiffness, or other, advantage has been gained as a result of the repair. The **official measurer** shall also describe the details of the repair on the **certificate**. ***

D.2.4 DEFINITIONS

- (a) HULL DATUM POINT

The **hull datum point** is ... ??? ***

- (b)

D.2.5 IDENTIFICATION

- (a) The hull shall carry The Laser Class Plaque with sail number permanently placed on the aft cockpit bulkhead.
- (b) A unique hull identification number (HIN) either under the bow eye or on the transom.

D.2.6 BUILDERS

- (a) The hull shall be built by a builder licensed by WS. ??? ***
- (b) All moulds shall be approved by WS. ??? ***
- (c)

D.3 HULL SHELL

D.3.1 MATERIALS

- (a) The hull shell shall be built from fibreglass & resin as specified in the Laser Construction Manual.

D.3.2 CONSTRUCTION

- (a) The hull shell shall be constructed in the manner specified in the Laser Construction Manual.

D.4 DECK

D.4.1 MATERIALS

- (a) The deck shall be built from fibreglass & resin as specified in the Laser Construction Manual.

D.4.2 CONSTRUCTION

- (a) The deck structure shall be constructed in the manner specified in the Laser Construction Manual.

D.5 BUOYANCY TANKS

D.5.1 CONSTRUCTION

- (a) The hull & deck mouldings shall form one complete buoyancy tank.
- (b) Additional buoyancy equipment shall comprise of flotation elements placed within the main buoyancy tank.

D.6 GUNWALE AND RUBBING STRAKES

D.6.1 MATERIALS

- (a) The gunwale shall be built from fibreglass & resin as specified in the Laser Construction Manual.

D.6.2 CONSTRUCTION

- (a) The gunwale shall be formed by the juncture of the hull & deck moulding as specified in the Laser Construction Manual.

D.7 BULKHEADS

D.7.1 MATERIALS

- (a) The bulkheads shall be built from fibreglass & resin as specified in the Laser Construction Manual.

D.7.2 CONSTRUCTION

- (a) The bulkheads shall be constructed in the manner specified in the Laser Construction Manual.

D.9 ASSEMBLED HULL

D.9.1 FITTINGS

- (a) MANDATORY

The following “standard” fittings shall be positioned in accordance with the measurement diagram:

- (1) Bow fairlead.
- (2) Cunningham / downhaul fairlead.
- (3) Cunningham / downhaul cleat.
- (4) Centreboard friction pad (Mk 1) with plastic pressure plate.
- (5) Mainsheet eye.
- (6) Hiking / Toe strap with plastic pressure plate.
- (7) Breather hole.
- (8) Hiking / Toe strap eyes (x2)
- (9) Cockpit drain
- (10) Bung for cockpit drain.
- (11) Traveller clam cleat. (Plastic - aluminium after XXX XXX).

- (12) Traveller fairleads (x2). (Plastic - aluminium after XXX XXX).
- (13) Rudder gudgeons (x2). (Stainless steel – plastic after XXX XXX).
- (14) Hull drain with bung.

(b) OPTIONAL

- (2) Cunningham / downhaul fairlead may be replaced by:
 - (i) Plastic fairlead with an “optional” stainless steel insert using the same fixing points.
 - (ii) Stainless steel “Builder supplied” block plate using the same fixing points to which two “optional” blocks shall be attached.



Figure 4 - Cunningham "standard" fairlead & "optional" deck block plate.

- (3) Cunningham / downhaul clam cleat may be replaced by:
 - (i) An aluminium clam cleat of the same design using the same fixing points.
 - (ii) Plastic “builder supplied” cleat plate using the same fixings to which two “optional” cleats shall be attached.



Figure 5 - Cunningham "standard" cleat, "optional" cleat & "optional" "builder supplied" cleat deck plate (without cleats).

- (4) Centreboard friction pad (Mk 1) with plastic pressure plate may be replaced by a Mk 2 Friction pad.



Figure 6 -

Friction Pads Mk 1 & "Optional" Mk 2

- (5) Mainsheet eye may be replaced by a swivel but if replaced the replacement shall be attached as per the diagram. (See XXX) ***
- (6) Hiking / Toe strap with plastic pressure plate may be replaced by any other hiking / toe strap that conform to the rules.
- (9) The Cockpit drain may be utilised to fit a "builder supplied" self-bailer. If fitted the actuating rod shall pass through the cockpit drain fitting.
- (10) If a self-bailer is fitted then the cockpit drain bung shall be replaced by a bailer bung.



Figure 7 - Laser "optional" self-bailer with bailer bung.

- (11) Traveller clam cleat may be replaced by:
 - (i) An aluminium clam cleat of the same design using the same fixing points.
 - (ii) An aluminium clam cleat of essentially the same design but with a "becket" cut out in the base using the same fixing points.
 (NB Aluminium clam cleats with a hard (darker) anodized finish are permitted.)



Figure 8 - Traveller clam cleats - "Standard" plastic, "optional" aluminium & "optional" aluminium with hard anodizing & "becket".

- (12) The traveller fairleads (x2 plastic) may be replaced by two aluminium fairleads of the same design using the same fixing points.
(NB Aluminium fairleads fitted as standard to Lasers after XXX XXX.)



Figure 9 - Traveller fairlead (plastic, various colours) & "Optional" fairlead (aluminium).

- (12) The stainless-steel rudder gudgeons fitted to earlier Lasers may be replaced by the plastic rudder gudgeons fitted to later Lasers.



Figure 10 - Laser gudgeons old & new

- (13) The original bayonet type hull drains with bung fitted to earlier Lasers may be replaced but if replaced the replacement fitting must provide for the watertight integrity of the hull to be maintained and the bung / plug is capable of resisting accidental dislodgement. ***



Figure 11 - Hull drain fittings old (bayonet) & new (screw).

In addition:

- (1) One inspection hole may be fitted to the hull provided that the watertight integrity of the hull is maintained and covers are capable of resisting accidental dislodgement. In practice this security is provided by screw fitment & not bayonet fitment.
- (2) Side deck cleats – Fitted in accordance with ***
- (3) Magnetic compasses - Fitted in accordance with ***

D.9.2 DIMENSIONS

The keel line shall be taken as the intersection line from transom to stem of the hull shell and the **hull** centre plane. ***

The sections shall be taken as vertical, transverse planes at the following positions:

Section 1: at ... mm from **hull datum point** as defined in D.2.3

Section 2: at ... mm from **hull datum point** as defined in D.2.3

etc.

The baseline shall be on the centre plane of the **hull** at the at following vertical distances:

at the **hull datum point** as defined in D.2.3: ... mm from the **hull** shell

at section ... : ... mm from the **hull** shell

Hull – Key dimensions		
	minimum	maximum
Overall length of hull		
Weight of Hull	57Kg	60Kg
NB The full specification of the hull is contained in the Laser Construction Manual (LCM).		

	minimum	maximum
Hull length	mm	mm
Vertical distance from baseline to underside of hull shell;		
at section ...		
at section ...		
Vertical distance from baseline to underside of keel		
at section ...		
Beam of hull , excluding rubbing strakes and fittings, at sheer line;		
at section ...		
at section ...		
at section ...		
Longitudinal distance from hull datum point as defined in D.2.3;		
to intersection of keel trailing edge and hull	mm	mm
to aft point of mast spar hole at deck	mm	mm
Longitudinal dimension of mast spar hole	mm	mm
distances from transom and forward end of hull ,		
Overall height of mast step		
		mm
Inside diameter of buoyancy tank inspection holes	mm	153
Inside diameter of buoyancy tank draining holes	mm	

D.9.3 WEIGHTS

	minimum	maximum
Hull Mass	kg Required	kg

Section E – Hull Appendages

E.1 PARTS

E.1.1 MANDATORY

- (a) **Centreboard**
- (b) **Rudder**

E.2 GENERAL

E.2.1 RULES

- (a) **Hull appendages** shall comply with the **class rules** in force at the time of the **certification** of the hull.

E.2.2 MODIFICATIONS, MAINTENANCE AND REPAIR

- (a) **Hull appendages** shall not be altered in any way except as permitted by these class rules.
- (b) Routine maintenance in order to keep the boat in race worth condition such as painting & polishing is permitted without re-measurement and re-**certification**.
- (c) Bona fide repair are allowed.

E.2.3 CERTIFICATION

- (a) The **official measurer** shall **certify hull appendages** and shall sign and date the **certification mark**. ***
- (b) An MNA may appoint one or more **In-House Official Measurers** to measure and **certify hull appendages** produced by that manufacturer.

E.2.3 DEFINITIONS

- (a)

E.2.4 MANUFACTURERS

- (a) The **hull appendages** shall be made by manufacturers licensed by WS.
- (b) All moulds & tooling shall be approved by WS.

E.3 KEEL/CENTREBOARD

E.3.1 RULES

- (a) The **keel** shall comply with the **class rules** in force at the time of the initial **certification** of the **hull**.
Or
- (a) The **centreboard** shall comply with the **class rules** in force at the time of the **certification**.
- (b)

E.3.2 CERTIFICATION

- (a) The **official measurer** shall **certify centreboards** and shall sign and date the **certification mark**.

E.3.3 DEFINITIONS

- (a)

E.3.4 MANUFACTURERS

- (a) Manufacturers shall be licensed by the WS.

(b) All moulds & tooling shall be approved by WS.

E.3.5 MATERIALS

(a) The **centreboard** shall be constructed from materials & in a manner as specified in the Laser Construction Manual.

It should be noted that over the life of the Laser certain changes have been made to the construction of the appendages. These changes have generally been brought about in order to reduce or contain costs or as a necessity such as brought about by obsolete tooling.

NB Changes have not been introduced to enhance performance.

- 1) Original foils were wooden.
- 2) Polyurethane foam with steel stiffeners.
- 3) Fibreglass & resin

D.6.2 CONSTRUCTION

(a) The centreboard shall be constructed as specified in the Laser Construction Manual.

(b) The **keel/centreboard** shall be covered with

(c)

E.3.6 CONSTRUCTION

(a) The **centreboard** shall be manufactured from a pattern approved by WS.

(b)

E.3.7 FITTINGS

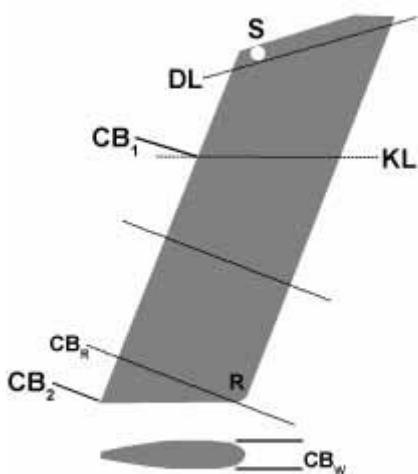
(a) MANDATORY

- (1) A centreboard stop of approved design shall be in place at all times when racing.
- (2) An effective centreboard retaining system shall be in place at all times when racing.

(b) OPTIONAL

- (1) A handle may be fitted that complies to class rules.

E.3.8 DIMENSIONS INCLUDING WEIGHT



Centreboard – Key dimensions		
	minimum	maximum
Maximum projection from hull		680mm
Width CB_w		341mm
Tip radius R		60mm
Tip drop CB_R-CB_2		135mm
Cord thickness		33mm
Weight of Centreboard (including stop)	4.43Kg	4.87Kg
NB The full specification of the centreboard is contained in the Laser Construction Manual (LCM).		

E.4 RUDDER BLADE, RUDDER STOCK AND TILLER

E.4.1 RULES

- (a) The **rudder** blade shall comply with the **class rules** in force at the time of **certification**.
- (b)

E.4.2 CERTIFICATION

- (a) The **official measurer** shall **certify rudder** blades and shall sign and date the **certification mark**.

E.4.3 DEFINITIONS

- (a)

E.4.4 MANUFACTURERS

- (a) Manufacturers shall be licensed by the ISAF. WS!!!
- (b)

E.4.5 MATERIALS

- (a) The **rudder** blade shall be made according to the Laser Construction Manual (LCM).
- (b) The **rudder** stock shall be of aluminium & made according to the Laser Construction Manual (LCM).
- (c) The tiller shall be of ...
- (d)

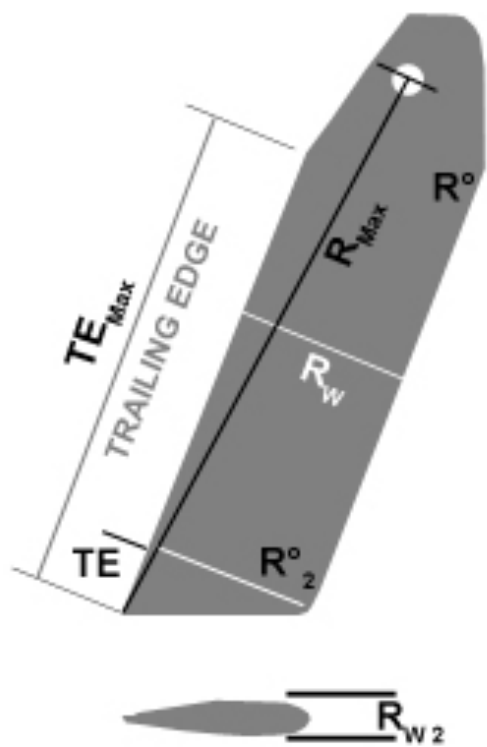
E.4.6 CONSTRUCTION

- (a) The **rudder** blade shall be manufactured in a mould approved by the ISAF.
- (b)

E.4.7 FITTINGS

- (a) MANDATORY
 - (1)
- (b) OPTIONAL
 - (1)

E.4.8 DIMENSIONS INCLUDING WEIGHT



Rudder blade – Key dimensions		
	minimum	maximum
Centre of pivot point to tip R_{Max}		635mm
Trailing edge length TE_{Max}		527mm
Width R_w		203mm
Tip radius R_2		60mm
Tip drop $R_2 - TE$		66mm
Cord thickness RW_2		20mm
Leading edge angle to design waterline. (Angle measured against the bottom edge of the rudder stock with the rudder in the fully down position. This angle may be increased by removing material from the rudder blade in way of the lower pintle spacer or decreased by winding tape around the lower pintle spacer.)		78°
Weight of Rudder blade	1.38Kg	1.66 Kg
NB The full specification of the rudder blade is contained in the Laser Construction Manual (LCM).		

Section F – Rig

F.1 PARTS

F.1.1 MANDATORY

- (a) Upper **Mast**
- (b) **Boom**
- (d) Running **rigging**

F.1.2 OPTIONAL

- (i) Standard Lower **Mast**
- (ii) Radial Lower **Mast**
- (iii) 4.7 Lower **Mast**

F.2 GENERAL

F.2.1 RULES

- (a) The Laser is one boat but with three different rigs to allow for variations in the size, age & skill of the sailors. The three different rigs utilise the same upper mast & boom but have different lower masts in order to accommodate the three different sail sizes. The Laser with the three different rigs are effectively raced as three separate classes.

- (1) Laser Standard
- (2) Laser Radial
- (3) Laser 4.7

- (b) The **spars** and their fittings shall comply with the **class rules** in force at the time of manufacture of the **spar**.
- (c) The running **rigging** shall comply with the **class rules**.

F.2.2 MODIFICATIONS, MAINTENANCE AND REPAIR

- (a) No modifications are allowed.
- (b) Maintenance in order to keep the boat in race worth condition is allowed.
- (c) Bona fide repair are allowed.

F.2.3 CERTIFICATION

- (a) No certification of **spars** is required.
- (b) No **certification** of running **rigging** is required.
- (c) An MNA may appoint one or more **In-House Official Measurers** to measure and **certify rigs** produced by that manufacturer.

F.2.4 DEFINITIONS

F.2.5 MANUFACTURER

- (a) Spar manufacturers are licenced.
- (b) A Licenced sticker shall be on each spar & shall not be tampered with or moved to another spar.

F.3 MAST

F.3.1 MATERIALS

- (a) The spars shall be of aluminium round tube with a Laser parts "tamper proof" label attached.
- (b) Permitted surface finish shall be anodised, paint or in the case of the composite spar epoxy resin.
- (c) An optional upper mast section constructed of composite material may be used with a Laser parts "tamper proof" label attached. It should be noted that this spar was developed to have the same static bend characteristics as the aluminium spar i.e. No performance benefit was sought except that the spar should have greater resilience.

F.3.2 Construction

- (a) The Laser Upper Mast:
 - (i) The standard Upper Mast shall be constructed from a round extruded aluminium tube of 2" outer diameter (see appendix for full tube specifications).
 - (ii) The "optional", "builder supplied" Upper Mast shall be constructed from a round composite tube (Full specification in the Laser Construction Manual).
- (b) The Laser Standard Lower mast shall be constructed from a round extruded aluminium tube of 2½" outer diameter (see appendix for full tube specifications).
- (c) The Laser Radial Lower Mast shall be constructed from a round extruded aluminium tube of 2¾" outer diameter (see appendix for full tube specifications).

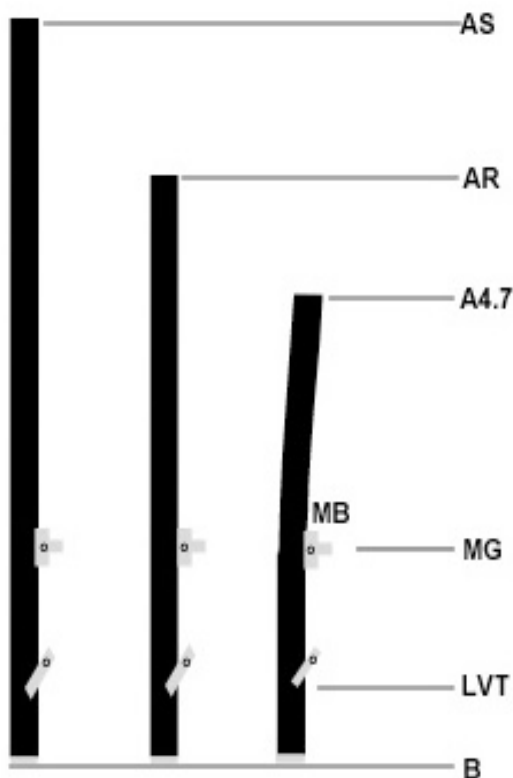
An internal stiffener of maximum length 2 252mm constructed from round extruded aluminium tube of 2¼" outer diameter may be added (see appendix for full tube specifications).
- (d) The Laser 4.7 Lower Mast shall be constructed from a round extruded aluminium tube of 2½" outer diameter (see appendix for full tube specifications).

F.3.3 FITTINGS

- (a) MANDATORY
 - (1) Laser Upper Mast
 - (i) Upper mast cap
 - (ii) Sleeving collar
 - (iii) Lower mast sleeving plug
 - (b) Laser Lower Masts all (Standard, Radial & 4.7)
 - (i) Gooseneck
 - (ii) Kicking strap attachment
 - (iii) Lower Mast heel plug
- (b) OPTIONAL
 - (1)

F.3.5 DIMENSIONS INCLUDING WEIGHTS

(1) Lower Mast Sections



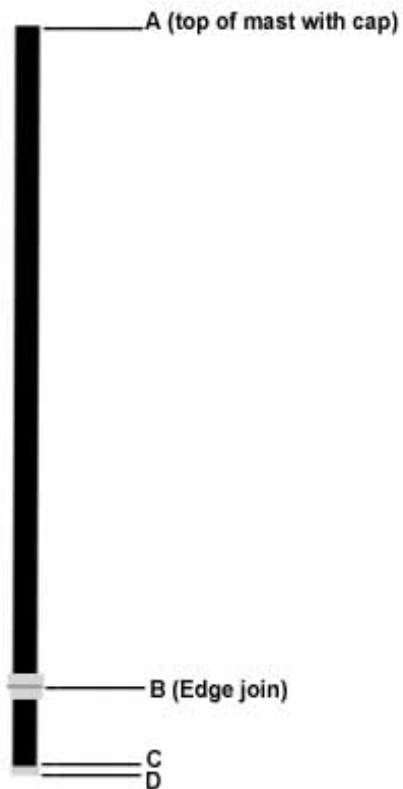
Lower Mast Section – Key Dimensions		
	minimum	maximum
	mm	mm
Standard Lower Mast: Overall length including heel plug (AS-B)	-	2 865
From lower face of heel plug to: Lower edge of vang tang (B-LVT)	445	465
Middle of gooseneck mounting (B-MG)	940	950
The mast shall be straight.		
Radial Lower Mast: Overall length including heel plug (AR-B)	-	2 262
Overall length of “stiffener”.	-	1 400
From lower face of heel plug to: Lower edge of vang tang (B-LVT)	445	465
Middle of gooseneck mounting (B-MG)	940	950
The mast shall be straight.		
4.7 Lower Mast: Overall length including heel plug (A4.7-B)	-	1 810
From lower face of heel plug to: Lower edge of vang tang (B-LVT)	445	465
Middle of gooseneck mounting (B-MG)	940	950
The mast is bent by 5 degrees at its mid-point during manufacture. No attempt shall be made to alter this angle (MB)		
Lower mast – Weights	minimum	maximum
	Kg	Kg
Standard - Weight including all fittings.	4.9	
Radial - Weight including all fittings.	4.0	
4.7 - Weight including all fittings.	3.5	
NB The full specification of these lower mast sections are contained in the Laser Construction Manual (LCM).		

F.4.6 LIMITATIONS

- The measurements include tolerances but it is not intended that these tolerances should be used to change the characteristics of the masts in any way.
- A mast section with a permanent bend (except 4.7) shall not be used.

F.3.5 DIMENSIONS INCLUDING WEIGHTS

(1) Top Mast Sections



Standard, Radial & 4.7 Upper mast – Key dimensions		
	minimum	maximum
Top of mast cap to end of tube. (A-C)		3 600mm
Lower mast bearing surface on sleeve to end of tube. (B-C)	300mm	310mm
The lower plug is not measured (C-D) Typically a bearing surface length of:	16mm	20mm
NB Topmasts are available in either aluminium or a composite material. The development of the composite topmast sought for there to be no performance benefit. The introduction of the composite version was intended only to increase the resilience of the topmast. The static bend characteristics are the same & the weight is the same as the original top mast although top sections were introduced with increased wall thickness (& thus heavier) also with the intention of increasing resilience.		
Weight of topmast	2.5Kg	
NB The full specification of this spar is contained in the Laser Construction Manual (LCM).		

F.4 BOOM

F.4.1 MATERIALS

- (a) The **spar** shall be of aluminium round tube with a Laser genuine parts “tamper proof” label attached.
- (b) Permitted surface finish shall be anodised or paint.

F.4.2 CONSTRUCTION

- (a) The **boom** shall be constructed from a round extruded aluminium tube of 2” outer diameter (see appendix for full tube specifications).
- (b) An internal stiffener of maximum length 900mm constructed from round extruded aluminium tube of 1.75” outer diameter may be added (see appendix for full tube specifications).

F.4.3 FITTINGS

(a) MANDATORY

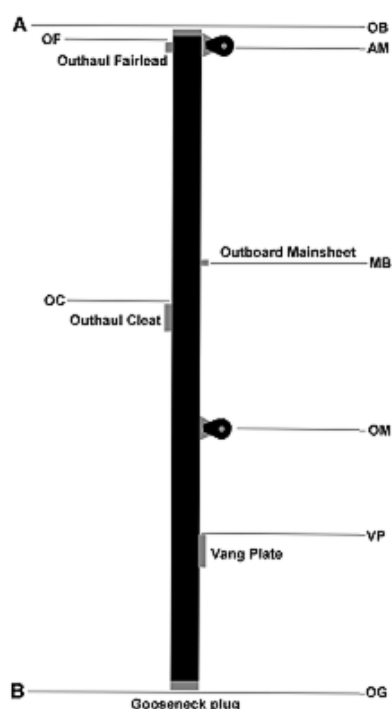
- (1) Gooseneck attachment.
- (2) Vang / Kicking strap key plate.
- (3) Single sheave mainsheet block with attachments.
- (4) Clew outhaul cleat.
- (5) Eye or webbing strap between the two mainsheet blocks.
- (6) Single sheave mainsheet block with becket & attachments.
- (7) Clew outhaul eye.
- (6) Cap at outboard end.

F.4.3 FITTINGS

(a) OPTIONAL

- (1) The mainsheet blocks may be replaced by blocks of original or later specification (see C.9.8.).
- (2) On booms fitted with a stainless-steel eye between the two mainsheet blocks this stainless-steel eye may be replaced by a plastic or webbing strap (see appendix for options). ***
- (3) On booms fitted with a plastic clam cleat the plastic cleat may be replaced by a similar aluminium one.

F.4.5 DIMENSIONS INCLUDING WEIGHTS



Boom – Key dimensions		
	minimum	maximum
Length overall (A-B).		2 740mm
Length of internal stiffener.	450mm	900mm
Forward face of gooseneck plug to: (OG)		
Aft edge of vang key plate (VP)		482mm
Aft face of end cap to: (OB)		
Middle mid boom block hanger. (OM)	1 641mm	1 665mm
Aft edge of boom cleat. (OC)	1 174mm	1198mm
Forward edge of mainsheet eye or strop.	1 022mm	1 072mm
Middle aft boom block hanger. (AM)	59mm	83mm
Aft edge of outhaul fairlead. (OF)	8mm	25mm
Weight of the boom	2.75Kg	
NB The full specification of the boom is contained in the Laser Construction Manual (LCM).		

F.4.6 LIMITATIONS

- The measurements include tolerances but it is not intended that these tolerances should be used to change the characteristics of the boom in any way.
- A boom with a permanent bend shall not be used.

F.4.16 WEIGHT

- The minimum mass of the boom shall be 2.75 Kg.

F.8 RUNNING RIGGING

F.8.1 MATERIALS

- Materials are optional except that steel wire shall not be used.

F.8.2 CONSTRUCTION

(a) MANDATORY

- Mainsail sheet**
- Mainsail - Vang / Kicking strap
- Mainsail - outhaul
- Mainsail - Cunningham / downhaul
- Traveller line.

- (b) OPTIONAL
 (1) None

- F.8.3 FITTINGS
 (a) MANDATORY
 (1)
 (3)

F.8.4 DIMENSIONS

	minimum	maximum
	mm	mm

Section G – Sails

G.1 PARTS

G.1.1 MANDATORY

- (a) **Mainsail**

G.1.2 OPTIONAL

- (a) None

G.2 GENERAL

G.2.1 RULES

- (a) **Sails** shall comply with the **class rules** in force at the time of **certification**. ***

G.2.2 CERTIFICATION

- (a) At competitions that require pre-race scrutinizing the **official measurer** shall **certify** mainsails in the **tack** with stamp, signature / initials & date.
- (b) **World Sailing** or an MNA may appoint one or more **In-House Official Measurers** to measure and **certify sails** produced by that manufacturer.

G.2.3 DEFINITIONS

- (a)

G.2.4 SAILMAKER

- (a) Only an approved sail maker may manufacture Laser sails.
- (b) Sails are manufactured in an approved manner with cutting, fixing & stitching processes controlled in such a way that the sails are as identical as practicable.

G.3 MAINSAIL

G.3.1 IDENTIFICATION

- (a) The class insignia shall conform with the dimensions and requirements as detailed in the diagram contained in The Laser Construction Manual & be placed in accordance with the diagram contained in The Laser Construction Manual. ***
- (b) At international events the countries three letter short code of which association the sailor is affiliated to is required to be displayed on both sides of the sail. (See ***
- (c) The identifying sail number shall be stuck to the sail:
 - (i) 4-digit numbers – All black.
 - (ii) 5-digit numbers – First one red or contrasting colour, last four black.
 - (iii) 6-digit number – First two red or a contrasting colour, last four black.

If a sailor chooses not to use black or red the colours used must be equally visible & equally contrasting.

Laser Standard sail - Numbers & letters height shall be 300mm.

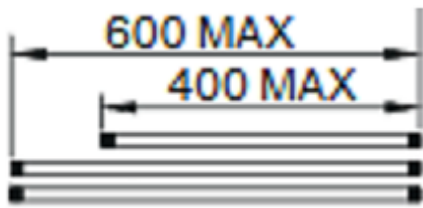
Laser Radial sail - Numbers & letters height shall be 300mm.

Laser 4.7 sail – Numbers & letters height shall be 225mm.

G.3.2 MATERIALS

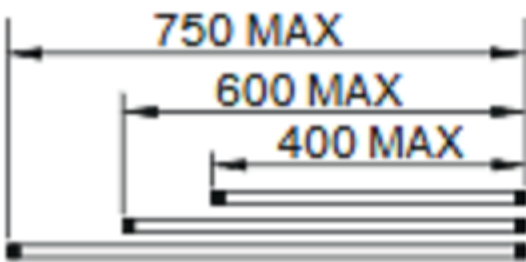
- (a) The **ply** fibres shall consist of Dacron or similar material as specified in the Laser Construction Manual (LCM).
- (b) **Stiffening** shall consist of additional layers of the same sailcloth material.
- (c) Battens

- (i) The Mk 1 (un-tapered) batten set shall be used with the Standard Mk 1 sail, the Radial (Mk 6) sail & the 4.7 sail. These battens shall be used without modification except that end caps with a curved tip may be fitted to the inner end. It should be noted that this modification is not intended to alter the effective length of the batten but simply to locate it more securely on the elastic tensioner at the inner end of the batten pocket. When fitted the length is measured from the middle of the concave.



Mk 1 (un-tapered) batten set
for use with the Standard Mk 1 sail,
the Radial (Mk 6) sail & the 4.7 sail.

- (ii) The Standard Mk 2 sail shall use the Mk 2 tapered batten set without modification.



Mk 2 (Tapered) Batten Set for use
only with the Standard Mk 2 sail.

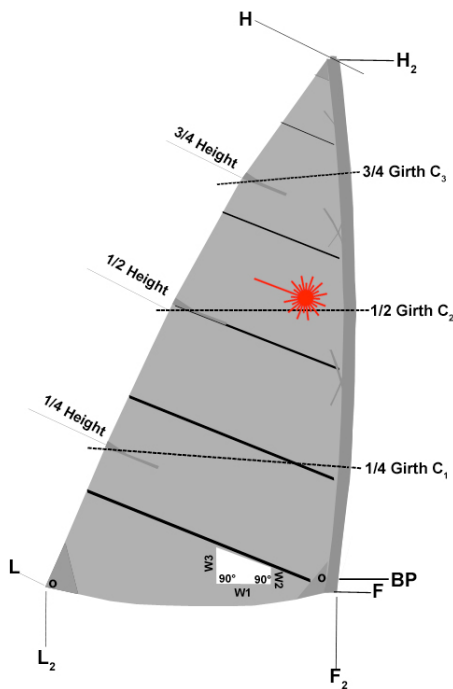
- (c) **Sail reinforcement** shall consist of additional layers of the same sailcloth material.

G.3.3 CONSTRUCTION

- (a) The construction shall be: **soft, single ply sail**.
- (b) The **body of the sail** shall consist of the same **woven ply** throughout.
- (c) The **sail** shall have 3 batten **pockets** in the **leech**.
- (d) The sail shall have a “tube” or “sleeve” luff.
- (e) The following are permitted: Stitching, glues, tapes, corner eyes, , Cunningham eye, **batten pocket patches**, batten pocket elastic, batten pocket end caps, one **window**, tell tales, sail shape indicator stripes and items as permitted or prescribed by other applicable *rules*.
- (f) The **leech** shall not extend aft of straight lines between:
- (1) the **aft head point** and the intersection of the **leech** and the upper edge of the nearest **batten pocket**,
 - (2) the intersection of the **leech** and the lower edge of a **batten pocket** and the intersection of the **leech** and the upper edge of an adjacent **batten pocket** below,
 - (3) the **clew point** and the intersection of the **leech** and the lower edge of the nearest **batten pocket**.

G.3.4 DIMENSIONS

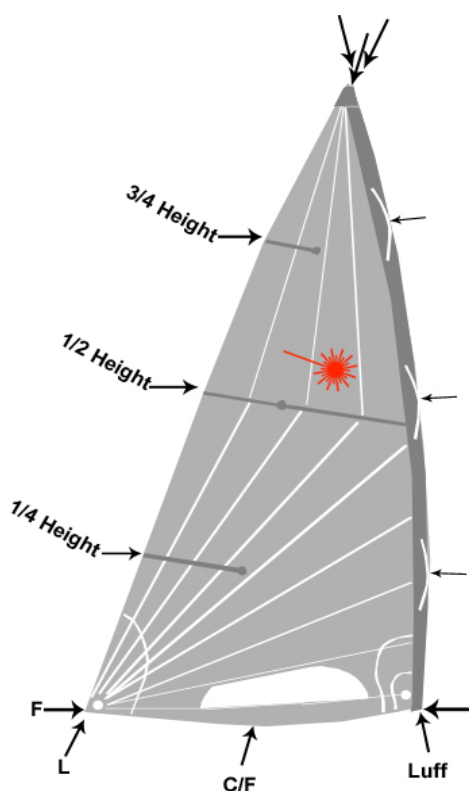
(1) Laser Standard Mk 1 Sail



Standard Mk 1 Sail – Key dimensions		
	minimum	maximum
Leech length (HL)	5 540mm	5 470mm
Luff length (FH2)	5 090mm	5 130mm
Foot length (FL2)	2 710mm	2 740mm
Quarter height girth (C1)	2 305mm	2 330mm
Half height girth (C2)	1 700mm	1 720mm
Three-quarter height girth (C3)	945mm	965mm
Batten lengths: (Mk 1 batten set)		
Upper most batten		450mm
Intermediate batten		640mm
Lower batten		640mm
Window dimensions:		
Width (W2)		495mm
Height – Forward (W3)		185mm
Height – aft (W1)		385mm
Cunningham cringle:		
Luff tube to bearing point (F BP)		100mm
Weight of sail cloth:		
Traditional American (28½" x 36")		3.8 oz
European standard (per square meter)		160 g
NB The full specification of this sail is contained in the Laser Construction Manual (LCM).		

NB: This sail remains class legal but has largely been superseded by the Standard Mk 2 sail. In the interests of uniformity, the Notice of Race of many events rules out the use of this sail.

(2) Laser Standard Mk 2 Sail

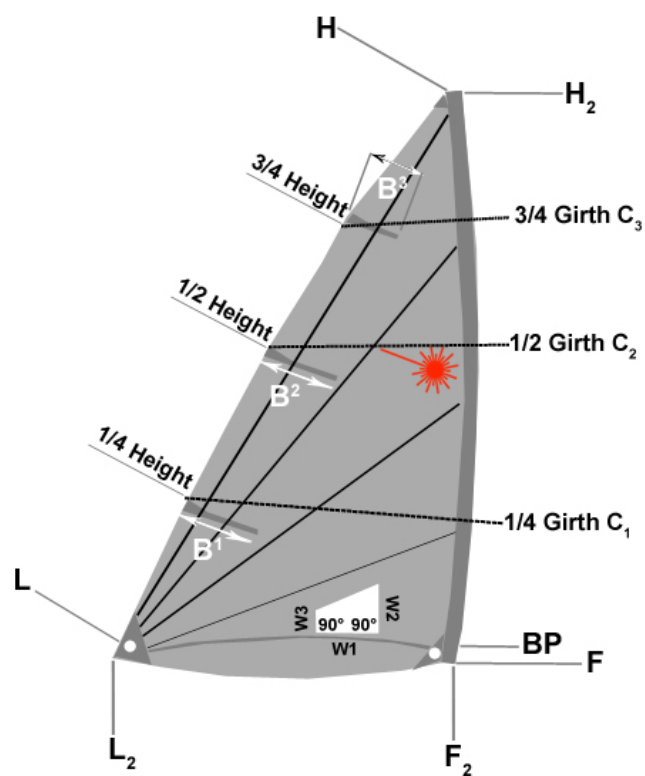


Standard Mk 2 Sail – Key measurements

	minimum	maximum
Leech length (HL)	5 520mm	5 555mm
Luff length (FH2)	5 080mm	5 100mm
Centrefold length (C)	5300mm	5350mm
Foot length (FL2)	2 720mm	2 750mm
Quarter height girth (C1)	2 325mm	2 350mm
Half height girth (C2)	1 740mm	1 765mm
Three-quarter height girth (C3)	965mm	990mm
Batten lengths: (Mk II tapered batten set)		
Upper most batten		400mm
Intermediate batten		600mm
Lower batten		750mm
Weight of sail cloth:		
Traditional American (28½" x 36")		4.5 oz
European standard (per square meter)		200 g

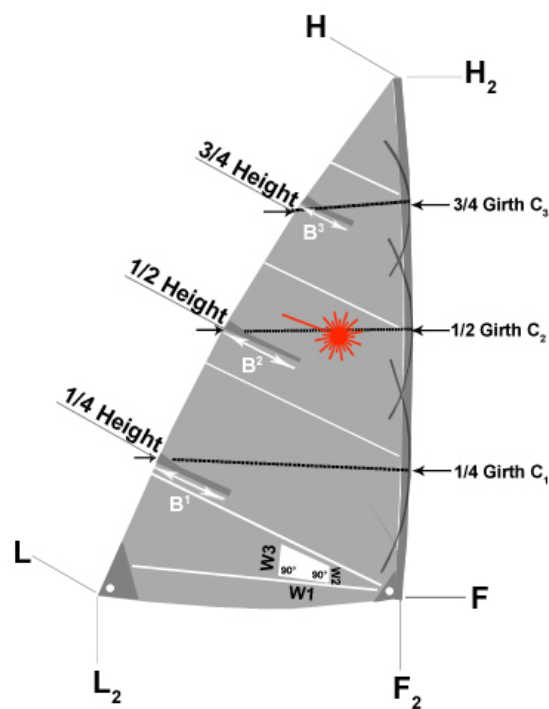
NB The full specification of this sail is contained in the Laser Construction Manual (LCM).

(3) Laser Radial Sail



Radial (Mk 6) Sail – Key dimensions		
	minimum	maximum
Leech length (LH)	4 980mm	5 010mm
Luff length (FH2)	4 520mm	4 560mm
Head to foot Centrefold length (CH)	4 740mm	4 780mm
Foot length (FL2)	2 710mm	2 740mm
Quarter height girth (C1)	2 325mm	2 345mm
Half height girth (C2)	1 705mm	1 725mm
Three-quarter height girth (C3)	910mm	930mm
Batten lengths: (Mk 1 batten set)		
Upper most batten		400mm
Intermediate batten		600mm
Lower batten		600mm
Window dimensions:		
Width (W1)		495mm
Height – Forward (W2)		185mm
Height – Aft (W3)		385mm
Cunningham cringle:		
Lower edge of luff tube to bearing point		100mm
Weight of sail cloth:		
Traditional American (28½" x 36")		4.0 oz
European standard (per square meter)		170 g
NB The full specification of this sail is contained in the Laser Construction Manual (LCM).		

(3) Laser 4.7 Sail



4.7 Sail – Key measurements		
	minimum	maximum
Leech length (HL)	4 500mm	5 540mm
Luff length (FH2)	4 045mm	4 085mm
Head to foot Centrefold length (C)	4 740mm	4 780mm
Foot length (FL2)	2 450mm	2 480mm
Quarter height girth (C1)	2 035mm	2 060mm
Half height girth (C2)	1 475mm	1 500mm
Three-quarter height girth (C3)	810mm	835mm
Batten lengths: (Mk 1 batten set)		
Upper most batten		400mm
Intermediate batten		600mm
Lower batten		600mm
Windows dimensions:		
Width		mm
Height – Forward		145mm
Height - Aft		295mm
Weight of sail cloth:		
Traditional American (28½" x 36")		3.8 oz
European standard (per square meter)		160 g
NB The full specification of this sail is contained in the Laser Construction Manual (LCM).		

The rules in Part III are **closed class rules**.

Measurement shall be carried out in accordance with the ERS except where changed in this Part.

Section H

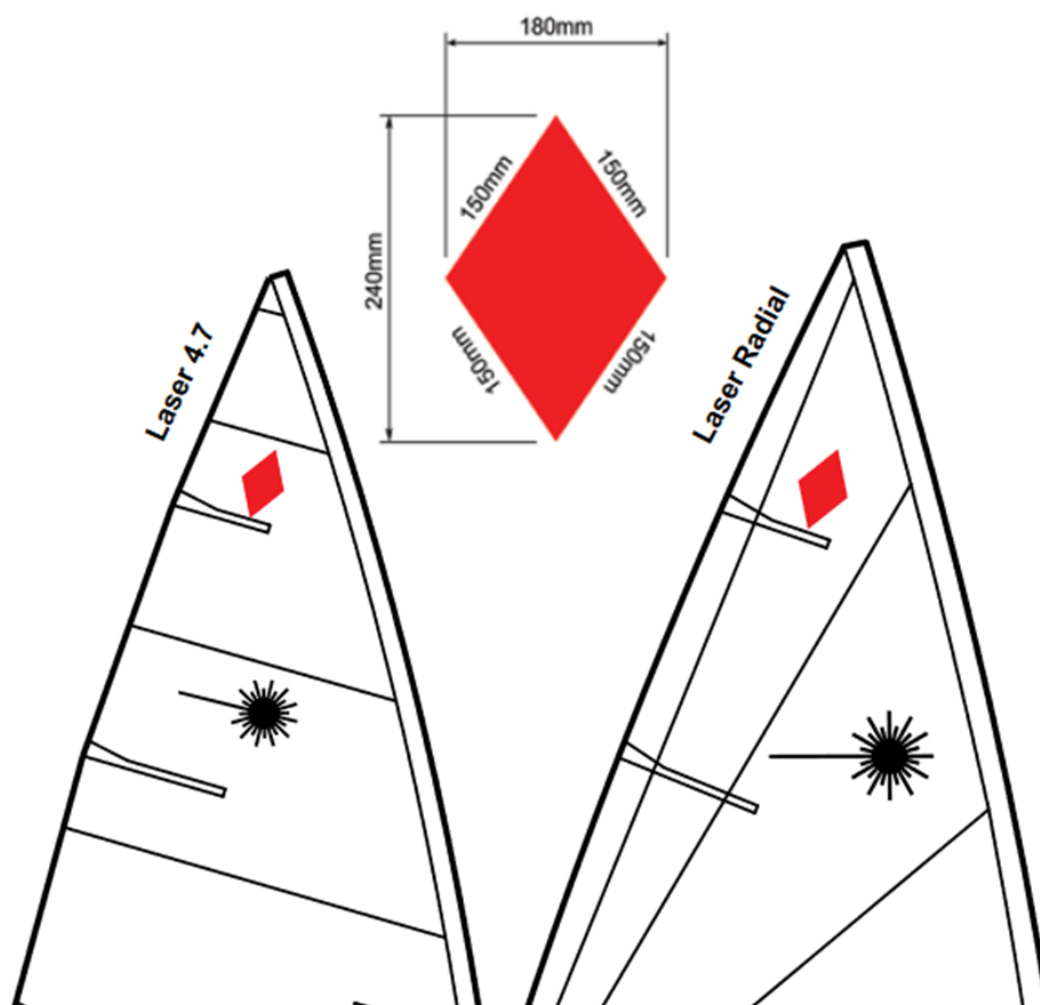
H.3 Red Rhombus Application for Women's Events

Instructions for Applying Red Rhombus For Women's Events

Sails used in the following women's events shall carry a red rhombus above the top batten pocket on both sides;

- World or regional (continental) championships.
- Events described as "international events" by the Notice of Race or Sailing Instructions.
- Other events that prescribe in the Notice of Race or Sailing Instructions that women competitors should be identified.

The minimum size and approximate position shall comply with diagrams below.
The rhombus may be retained for racing in other events.



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