
International Laser
Class Association

Laser Class (Radial, Standard and 4.7)

- Lasers are Measurement-controlled.
- Don’t follow the ERS.
- Have 4 builders worldwide divided in territories and following the LCM (Laser construction manual) .
- Appoint a Technical Committee and a Chief Measurer.
- Use IMs to run the inspections at their major events.

Technical Committee functions:

- Deal with Class Rules, measurement issues & technical matters.
- Examine proposals from members for rule changes.
- Propose rule changes to the Class Management : World council.

Laser class

Technical Committee Composition :

- TC Chairman , the chief measurer, one technical consultant plus the technical officer plus the executive secretary and a technical from the builder
- TC Chairman is an Executive Officer of the Class.

Chief Measurer Duties & Appointment:

- Manages the IM team of the Class.
- Proposes IM appointments for events and prototype measurement.
- Set up procedures for inspections at the Class events

IM appointments:

– IM numbers according to the regional needs (events).

- 4 in Europe, 1 in North America, 1 in Asia (2 more should be appointed at the 2012 Isaf meeting 1 more in Asia and one in Australia/New Zealand)

– Candidates have to attend a class seminar or worked at worlds championships with existing IM

Official Measurer appointments:

- Laser class don't follow the ERS, they appoint directly OMs.
- There is a Class-specific OM training offered.
- OMs that are registered with the Class and have to follow the Laser measurement manual.
- It should be a district measurer in each district.
- The class is organizing measurer seminar.

Laser class

Class Rules Management:

- TC may prepare rule change proposals.
- TC considers proposals from Class Members .
- TC reports to the world council.
- Any changes to the class rule has to voted by 2/3 of the voting member.
- ISAF considers all rule change proposals from the class who has been voted by to 2/3 of the members as in our by-law.

Laser class

Certification System:

- hulls and spars, foils, sails are in house certified.
- Boat measurement certificates issued by the builder, not required to show but existing.
- Laser: Sequential sail numbers (currently close to 204000).
- Spars, foils must have a Laser sticker (sticker if removed will leave the word void)
- All the sails has an identification number in the leech.

Laser class

Builder Control:

- The Laser class has a technical officer who visit regularly the plants and sail lofts.
- The technical officer make report to the world council and is in charge of the LCM (laser construction manual).
- 2 builders are member of the world council.
- There is also an advisory council who include the chairman and the builders).

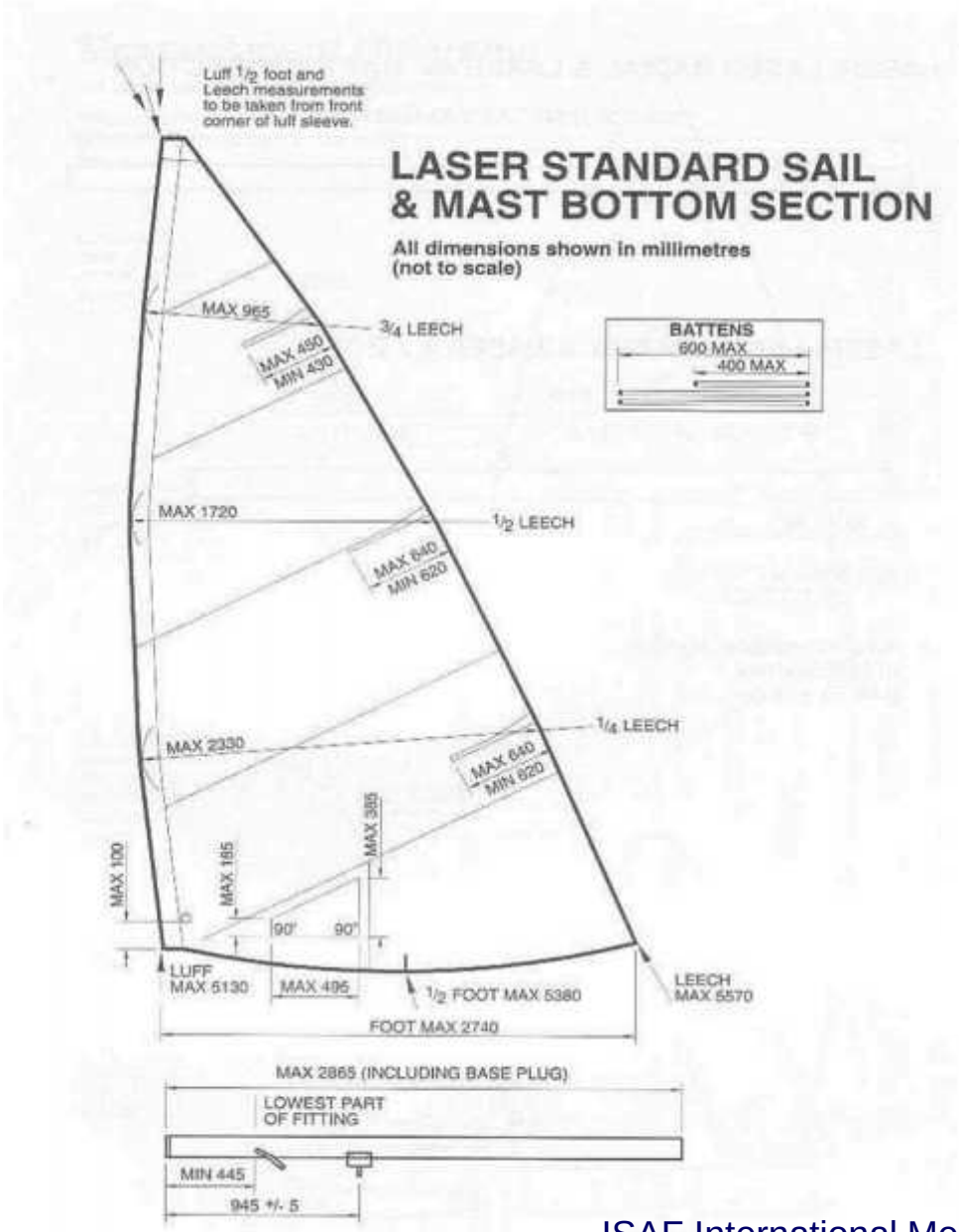
Laser class

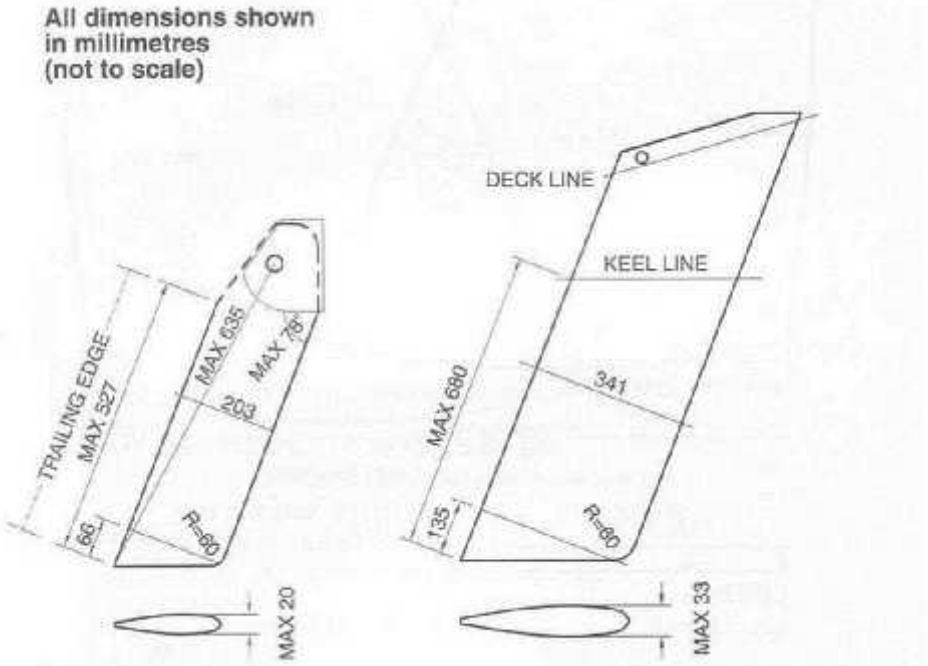
Class Rule Highlights:

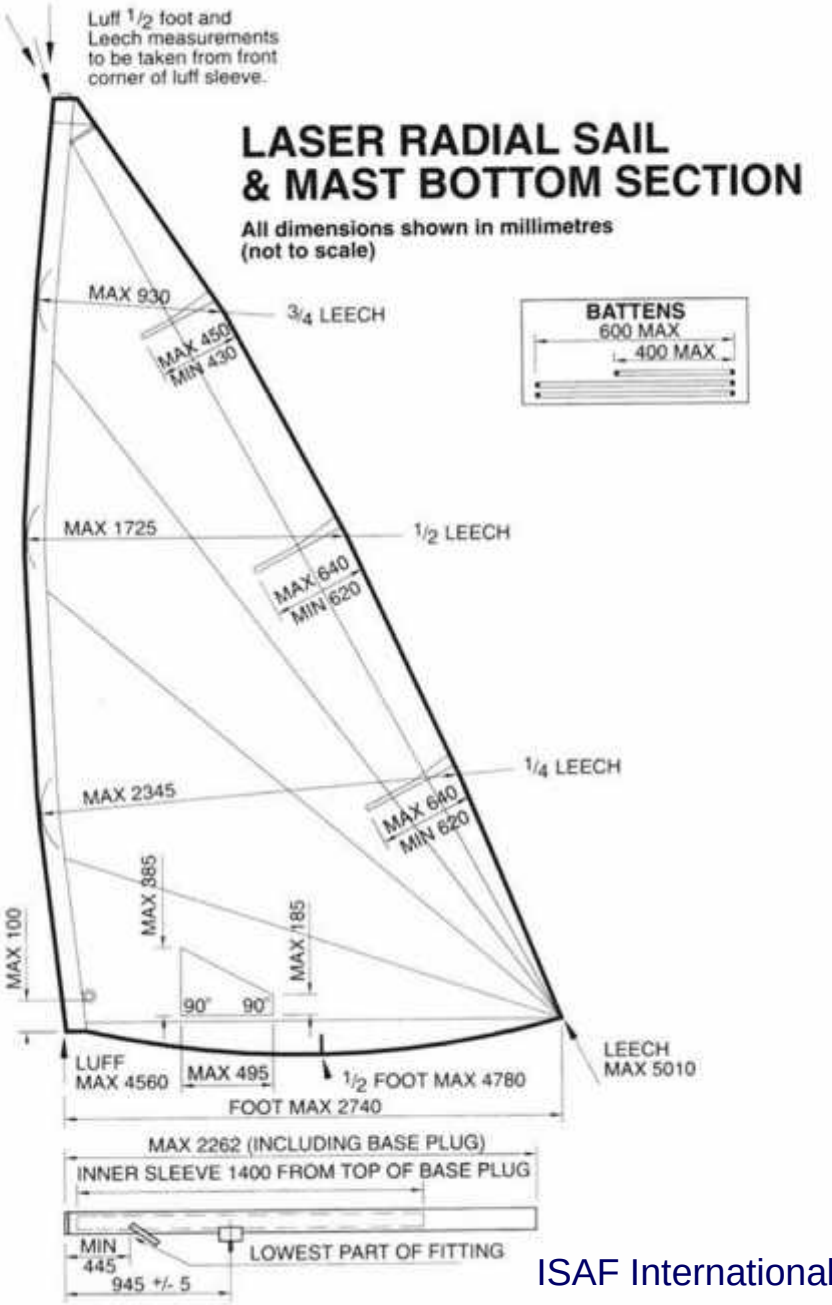
- Rig measurements include length dimensions, positions of fittings, check it is a legal spar, the spars must be straight (except for the 4.7 bottom section).

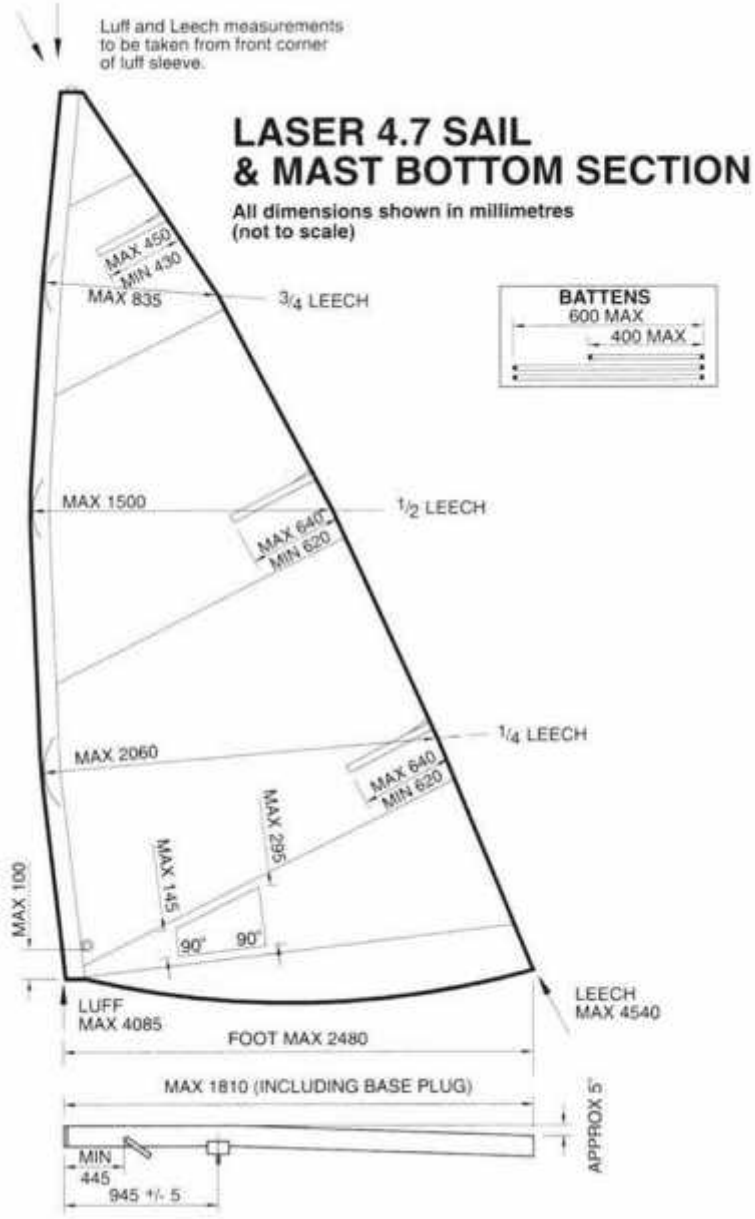
- During events: 1 hull, 1 top mast, 1 bottom section, 1 boom, 1 rudder, 1 centreboard, 1 sail and 1 set of battens may be used. These items are always limitation marked at the Class major events.
- Check for any added equipment or setting not permitted in the class rules

Laser


Luff 1/2 foot and Leech measurements to be taken from front corner of luff sleeve.
LASER STANDARD SAIL & MAST BOTTOM SECTION
All dimensions shown in millimetres (not to scale)
MAX 965
3/4 LEECH
MAX 490 MIN 430
BATTENS
600 MAX
400 MAX
MAX 1720
1/2 LEECH
MAX 640 MIN 620
MAX 2330
1/4 LEECH
MAX 640 MIN 620
MAX 100
MAX 185
MAX 385
90°
90°
LUFF MAX 5130
MAX 496
1/2 FOOT MAX 5380
LEECH MAX 5570
FOOT MAX 2740
MAX 2865 (INCLUDING BASE PLUG)
LOWEST PART OF FITTING
MIN 445
945 +/- 5


All dimensions shown in millimetres (not to scale)
TRAILING EDGE
MAX 527
MAX 635
MAX 76°
203
66
R=60
MAX 20
DECK LINE
KEEL LINE
MAX 680
341
135
R=60
MAX 33


Luff 1/2 foot and
Leech measurements
to be taken from front
corner of luff sleeve.
LASER RADIAL SAIL
& MAST BOTTOM SECTION
All dimensions shown in millimetres
(not to scale)
BATTENS
600 MAX
400 MAX
MAX 930
3/4 LEECH
MAX 450
MIN 430
MAX 1725
1/2 LEECH
MAX 640
MIN 620
MAX 2345
1/4 LEECH
MAX 640
MIN 620
MAX 100
MAX 385
MAX 185
90°
90°
LUFF
MAX 4560
MAX 495
1/2 FOOT MAX 4780
FOOT MAX 2740
LEECH
MAX 5010
MAX 2262 (INCLUDING BASE PLUG)
INNER SLEEVE 1400 FROM TOP OF BASE PLUG
MIN
445
945 +/- 5
LOWEST PART OF FITTING


Luff and Leech measurements
to be taken from front corner
of luff sleeve.
LASER 4.7 SAIL
& MAST BOTTOM SECTION
All dimensions shown in millimetres
(not to scale)
BATTENS
600 MAX
400 MAX
MAX 450
MIN 430
MAX 835
3/4 LEECH
MAX 1500
1/2 LEECH
MAX 640
MIN 620
MAX 2060
1/4 LEECH
MAX 640
MIN 620
MAX 100
MAX 145
MAX 295
90°
90°
LUFF
MAX 4085
FOOT MAX 2480
LEECH
MAX 4540
MAX 1810 (INCLUDING BASE PLUG)
APPROX 5°
MIN
445
945 +/- 5

Inspection is a quick check over the Laser and its equipment to ensure compliance with the Rules. Its purpose is to determine any changes not permitted in the Class Rules that may have been made to the standard boat.

The person doing the inspection must be familiar with the layout and equipment of the standard Laser supplied by the manufacturer and be fully aware of, and able to identify, the few changes that can be made to a Laser as permitted by the Class Rules.

"**NO CHANGES TO THE BOAT ARE ALLOWED UNLESS SPECIFICALLY PERMITTED BY THE CLASS RULES"**

It is not the responsibility of the inspectors to explain why a Laser is illegal except to quote the Fundamental Rule from Part 1 of the Rule Book.

Inspection procedure for Principal Class Events:

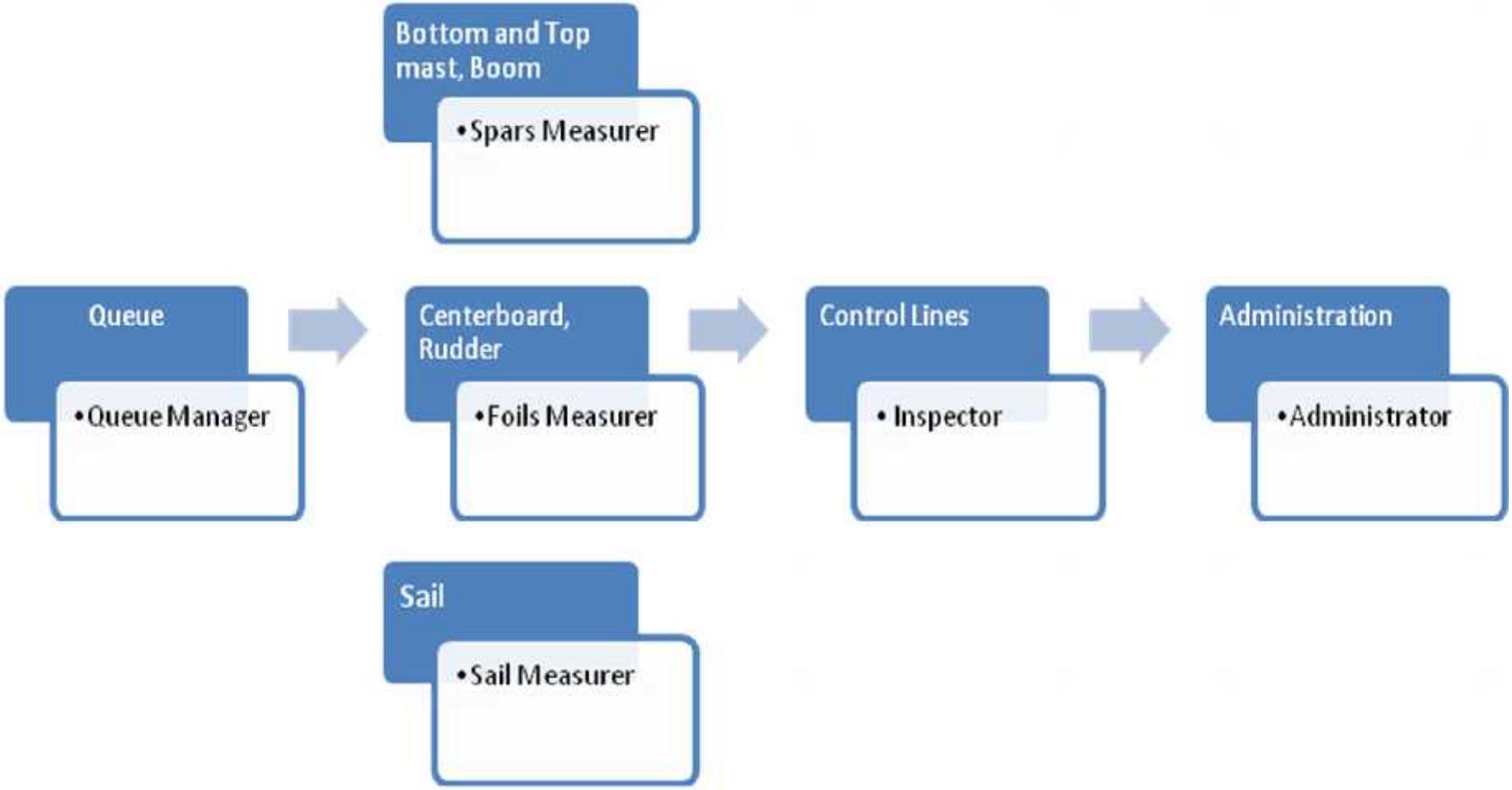
- Worlds (150-400 boats) & Europeans: 2 or 2 and a half Inspection days: The inspection of a Laser should not take longer than 5 minutes on average.
- Inspection team led by Class IM.
- 8-10 assistants.
- 4 Stations: Hull, sails, spars, foils . Control lines are checked in the waiting line
- Equipment provided by Organizing Authority: Tables for sails and rig, Inspections inside tent or fixed building, protected from the elements depending of the conditions .
- Equipment provided by Class: template and rulers.

For inspection of 2 boats at a time:

Queue Manager (2 person)
Spars Measurer (2 person)
Foils Measurer (1 person)
Sail Measurer (4 persons)
Administrator (1 person)
Inspector (2 person)

During the measurement people may be replaced by others or may change roles, but it is important that the person that performs a specific role knows the stage tasks and responsibilities. By doing so, the measurement procedure stays effective even when the team changes. For effective knowledge transfer it is a good practice to have a short briefing with all people that assist with the measurement and to measure the first boat together with the whole team.

Measurement Stages



- **Queue Manager**

The Queue Manager polices the waiting queue and ensures that the sailors behave. This is important as misbehavior, which is especially common with young sailors, is creating a lot of friction between sailors.

- The Queue Manager ensures that boats are clean by asking to remove all items that are not required for measurement; examples are extra mast sections and extra sails but also sail and foil bags. All these unnecessary items lead to mistakes (e.g. measured wrong sail) and cause delays.
- The Queue Manager hands the measurement form over and asks the sailor to fill out their name, sex, hull and sail number.
- If at the end of the day there are sailors still waiting, the Queue Manager gives them a numbered and signed measurement form that allows them to use the “Fast Track” at the start of the next measurement day.

- **Spars Measurer**

After queuing the inspection of the spars, foils and sail can be done in parallel. The bottom mast section, top mast section and boom get inspected by the Spars Measurer. The Spars Measurer will at least look at the following:

- Bottom and top mast sections and boom are Laser supplied parts (check builder sticker)
- Top mast section should be straight
- If fittings are changed then special attention is required for their position (collar at 305mm, +/- 5mm) and whether the top mast section is watertight
- The bottom drain hole of the bottom mast section needs to be open

- **Control lines inspector**
- The sailor rigs the boat for final inspection with only the bottom section and boom on with all control lines on.

- **Foils Measurer**

It is good practice that the Foils Measurer inspects the sail battens as well.

- Rudder blade thickness (using template)
- Rudder blade angle of 78° relative to bottom of the rudder head (visible wearing)
- Rudder head is Laser supplied part (check builder sticker)
- Pivot bolt diameter not larger than 10mm and pivot bolt washer not larger than 20mm
- Tiller should be removable
- Centerboard is Laser supplied part (check builder sticker)
- Centerboard stopper should be original and fixed

Sail Measurer

The sail gets inspected by the Sail Measurers. In order to be effective two Sail Measurers are required to unroll or unfold the sail before inspection and roll and fold the sail after inspection. Note that if sail bags were removed as asked by the Queue Manager the inspection will go faster. The Sail Measurers look at the following items:

- The sail is a Laser supplied part (check sail button)
- The sail number corresponds with the number on the measurement form
- The position, color and readability of the sail number and the national letters (start 100mm, +/- 12mm from leech, equal spacing of min 30mm for 4.7, 50 mm for Radial and Standard)

- **Final Inspector**

After measurement of Spars, Foils and Sail, the Inspector checks whether all measured items received their stamps or signatures. A general inspection of the boat is performed by checking the hull, control lines and fittings. If the boat passes the inspection the Inspector signs the measurement form and hands it over to the Administrator. In case some parts fail the inspection the Inspector marks the issues on the measurement form.

- **Administrator**

The Administrator keeps track of the measurement process. Passed boats get marked on the list of competitors and the sailor receives the signed measurement form which he or she needs for registration. The measurement forms of the boats that failed inspection are kept in a binder until the sailor returns with corrected items. Only when the boat passes inspection the sailor receives the signed measurement form.

DISTRICT MEASURERS MANUAL

CONTENTS

Sailor allocated Number:

LASER SENIOR STANDARD AND WOMEN RADIAL WORLDS 2012

MEASUREMENT AND INSPECTION FORM

Sail Number: _____ Nation: _____ Pass ☐

Competitors Name: NUMBER : On Hold ☐

Declaration to be signed by competitor:
I passed measurement and I will not change anything on my boat without the permission of the measurer or the race committee
Signed: _____

Request to Sail with an alternate sail number:
I request to compete with an alternate sail number to the hull number for this regatta
Hull No: _____ Sail No: _____
Signed: _____

Stamped	Yes	No
Top Section		
Bottom Section		
Boom		
Centreboard		
Rudder		
Rudder Head (sticker needed)		
Sail		
Battens		
Hull		

Top Section	Problem	Fixed
Fitting locations within tolerance and standard types (with builder sticker)		
Section is straight		
Section appears watertight		
No fairing around collar		
Balance Test		

Bottom Section	Problem	Fixed
Fitting locations within tolerance and standard types (with builder sticker)		
Radial sleeve within tolerance		
Section is straight		
Bottom drain hole open		

Boom	Problem	Fixed
Fitting locations within tolerance and standard types (with builder sticker)		
Sleeve within tolerance	NC	

Centreboard if GRP laser logo	Problem	Fixed
Thickness OK (max 33mm)		
Handle (if fitted) has not more than 2 holes of 12.5 mm diameter (max) & 1 piece of rope (rubber or plastic tape / tubes permitted)		
Standard stopper assembly fitted, may be glued, screwed, bolted including the use of washers. Original dimensions must not be reduced		
Meets standard profile and shape. Fairing of the trailing edge OK (max 100mm)		
Refinishing OK (No reinforcing permitted)		

Retaining line / shock cord fitted and is adequate to retain board		

Rudder if GRP laser logo	Problem	Fixed
Thickness OK (max 20 mm)		
Meets standard profile and shape. Fairing of the trailing edge OK (max 50mm)		
Refinishing OK (No reinforcing permitted)		
Rudder Angle 78 degrees. Tape permitted to correct angle. Check for tampering of bottom of rudder box		
Rudder bolt 10 mm Diameter Max		
Rudder washers 20mm Dia. Max		
Downhaul line fitted (multiple purchases OK)		
Rudder Head is not fixed along the bottom edge		

Tiller	Problem	Fixed
Tiller able to be removed from rudder box		
Fitted with cleat for rudder downhaul		
Straight along topmost edge (from 30mm in front of rudder box)		
Wear strip / roller of not more than 200mm		

Hull	Problem	Fixed
Hull OK (not extensively sanded, faired or refinished		
Internal Skin OK (no reinforcing that is not a repair)		
Floatation OK (Foam Blocks or builder supplied cube containers present)		
Centreboard case free of wedges, silicon, tape or padding. Other than the single layer of any material, 30mm X 30 mm on 2 mm thickness		
Mast step is free of any devices restricting fore and aft movement		
Self bailer (No fairing to the hull permitted but sealing in place OK)		
Hatches (if fitted) Max 153mm diameter and threaded		
Storage bags OK		

Mainsheet	Problem	Fixed
One continuous length		

Traveller	Problem	Fixed
One continuous length		
Simple triangle configuration, no multi purchase systems permitted		
Blocks taped together, no Plastic tubes		
Traveller and cunningham fairleads are standard (Stainless Steel inserts allowed only for Cunningham fairlead)		

General	Problem	Fixed
Thimbles of 40 mm max length		
Pulleys, sheave diameter between 15 & 30mm		
Rope handles permitted, with rubber, plastic or tape coverings		
Cunningham / outhaul cleat base & gate not modified in any way. The cleats may be mounted on wedges or pads to raise them		
All ropes must be of uniform thickness, other than splice at load bearing end		
Free ends of lines are not permitted to be attached to shock cord (except the mainsheet)		

Outhaul	Problem	Fixed
2 Lines max		
6 turning points max (not including (not including the deck mounted pulley)		
Line for optional block no further than 100mm from gooseneck bolt (acceptable 3rd line or a shackle)		
Quick release hook for clew, rope or shock cord loops for line retaining and shock cord for pulling back foot permitted (attached to optional block ok)		

Cunningham	Passed	Failed
3 Lines max		
No aramid (Kevlar) rope permitted		
5 turning points max (not including the fairlead or deck mounted pulley)		
1 line must pass through the eye of the sail and be tied to the gooseneck or vang fittings		
The line shall only pass through the deck fitting once		

Boom Vang	Problem	Fixed
2 lines max		
No aramid (kevlar) rope permitted		
7 turning points max		
Standard Key – bent or straight (maximum of 2)		
Swivel and / or shackles permitted max length 60mm		

Outhaul Tie Down	Problem	Fixed
Strap, or a rope with or without beads or rollers permitted		

Hiking Strap	Problem	Fixed
Non Stretch material		
Attached forward using the mainsheet pressure plate or the mainsheet pressure plate and centreboard friction attachment plate		
Shock cord attached either to traveller cleat or hiking strap eyes and the aft end of the strap		
Only one loop at the back		

Compass & Watches	Problem	Fixed
Electronic Compasses and other electronics are not permitted, other than timing devices worn on the wrist		
Compasses if fitted must not pierce the hull, fasteners exempt		

Battens	Problem	Fixed
Standard Section, length and Caps measured from the centre of the concave. Batten ends must be present		

Safety Equipment	Problem	Fixed
Line or shock cord connecting mast and hull		

Sail	Problem	Fixed
Sail No's corresponds to Hull No unless appropriate application has been made to Race committee		
Sail No's are adhesive (No marker pens)		
Starboard Sail No's uppermost (400 +/- 12mm below mid batten seam. Port side 400+/- 12mm below		
Sail No's 300mm H, 45mm T, 200mm Wide (excluding # 1)		
Sail No's regularly spaced (min 50mm & 100mm in from leech)		
National letters as per specs		
Are there any alterations or repairs? Note:		

Advertising	Problem	Fixed
No advertising on foils		
No advertising in the region forward 25% hull except that required by the organising authority		
Decals Correctly Positioned		

Did you find anything else unusual that has not been covered elsewhere? Note:	Problem	Fixed