



Required Measurement Procedure for Regattas

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APPLICABILITY

This procedure shall be used for the measurement of Lightning Class Sailboats at regattas when measurement is required by the International Lightning Class Association.

PURPOSE

The primary purpose of this procedure is to ensure measurement uniformity. This procedure outlines the required measurements. Additional specifics can be found in the specifications. The measurement process illustrated in this procedure is used only as an example. The actual measurements process is at the discretion of the host organization.

MEASUREMENT COMMITTEE STRUCTURE FOR THE SITE

A site measurement committee should be appointed by the host club's organizing committee and headed by a single member. When at all possible, the committee should include a certified measurer of the class. A member of the ILCA Measurement Committee will be appointed by the ILCA Chief Measurer to act as a member of the site measurement committee

REQUIRED MEASUREMENT TOOLS

The following equipment is required to conduct measurement and will be provided by the International Lightning Class Association:

1. Scale for boat weight
2. Angle of dangle template
3. Centerboard thickness gage
4. Centerboard slot gage
5. Arc templates 8 foot and 15 foot
6. Sail templates (spinnaker, main and jib)
7. Measurement control form (as part of this procedure)
8. Clipboards and pens for each measurement station

The Site will also need the following items to conduct the measurement process:

1. shroud tape
2. permanent markers for shroud tape

3. Stamp for sails
4. hoists and/or lifting devices (the more used the faster the process)
5. 25# scale
6. 12' and 30' tape measures
7. Stamp for sails
8. Rudder gap gage

MEASUREMENT REQUIREMENTS

The following is the list of required measurements and summaries of how to conduct the measurement. The measurement committee may choose to modify this procedure based on the needs of the class. The site measurement committee can, with the approval of the ILCA measurement committee conduct additional measurements.

SAFETY EQUIPMENT

Specification (Bylaws ART VIII # 5):

A boat must carry ground tackle of serviceable character for the locality, **three life preservers, a compass, minimum one gallon bucket, throwable life preserver with attached whistle, and a paddle** as approved by the Race Committee. In absence of special conditions, the ground tackle shall be a **fluke-type anchor weighing not less than 4 pounds (1.8 kg) with 50 feet of line** attached. Variation may be made only by specific written permission from the Chief Measurer when local conditions dictate. A boat must be fitted with a **centerboard preventer**.

Measurement

Visually inspect that all safety gear as required by the specification is present, that the whistle works and that the centerboard preventer is properly rigged.

WEIGHT

Specification ART I #22:

Weight of the hull and rigging shall not be less than 317.5179 kg (700 lbs.). The boat shall be weighed with spars, standing rigging, halyards, main, jib and one set of spinnaker sheets, boom vang gear, rudder, tiller, hiking stick, centerboard, one spinnaker pole, hiking straps, attached compasses, built-in non-removable drawers or compartments of reasonable size and construction, and automatic bailers. **Weight does not include sails, paddle, boom crutch, removable drawers, loose equipment, containers, life preservers, tools, anchors, anchor lines and other miscellaneous lines** or any other items. The boat will be **weighed as dry as conditions permit** and air tanks shall be opened and checked that they are shall be free of water.

Measurement:

Ensure that boat is dry, inspect ports and all extra equipment is removed from the boat. Compare the placement of corrector weights to the measurement certificate then weigh boat using scale.

Record the weight and placement of any corrector weights on the measurement certificate

NOTE:

1. If there is wind present assure that the orientation of the boats to the wind is consistent.
2. Multiple scales can be used if they are calibrated against each other and are recalibrated after 15 boats.

MAST

1. Mast Band:

(Specification ART II # 51) A measurement band not less than 13 mm (1/2") wide and clearly discernable while racing shall be painted on the mast with its upper edge not more than 7315 mm (24') below the top of the main halyard sheave groove. The line of the top of the boom extended, if necessary, shall not be below the upper edge of this band.

Measurement:

Measure along the aft edge of the mast from the top of the ***halyard sheave grove to the top of the boom band***. Ensure ***no greater than 24 feet***. When boom is attached ensure the top of the boom and the upper edge of boom is aligned.

2. Spinnaker Halyard Length Exit:

(taken from the drawings) From the top of Main halyard sheave groove to spinnaker halyard shall not be less than 63 5/8".

Measurement:

The site committee can request that this measurement not be included or a random sampling procedure used. Measure the distance, along the front of the mast, from the ***top of the main halyard sheave grove to the top of the spinnaker halyard***. Ensure measurement is at least ***63 5/8"***.

3. Mast Length:

(taken from the drawings) From the bottom of Halyard sheave grove to bottom of the mast shall measure ***329" (27'-5") +/- 1/4"***.

Measurement:

The site committee can request that this measurement not be included or a random sampling procedure used. Measure along the aft edge of the mast from the top of the mast to the bottom of the mast. Ensure measurement is 329" (27'-5") =/- 1/4".

It is not recommended that this be done for every mast.

4. Mast Foam:

(Specification ART 11 #54) Aluminum masts shall be filled with ***foam from spinnaker halyard exit to the top of the mast***.

Measurement:

Sighting through all possible openings in the mast visually inspect for foam. If there is no indication of foam, remove mast cap to sight down the mast.

5. Mast Decal:

Mast must have an ILCA sticker. Note serial number on the measurement certificate if different. ***Correct the certificate and date it if a certified measurer is present.***

BOOM

1. Length to Band:

(Specification ART II # 55) A measurement band not less than 12 mm (1/2") wide and clearly discernable while racing shall be painted on the boom with its forward edge not more than 3048 mm (10') from the aft side of the mast. The mainsail shall not extend aft of the forward edge of this band.

Measurement:

Holding the boom parallel to the deck, measure from the aft edge of the mast to the leading edge of the mast band ensuring it does not exceed 10'.

2. Overall Length:

(From plans) Overall length of the boom from the aft edge of the mast to the end of the boom shall not exceed 122".

Measurement:

The site committee can request that this measurement not be included or a random sampling procedure used. Holding the boom parallel to the deck, measure from the aft edge of the mast to the end of the boom does not exceed 122"

RUDDER

1. Rudder Gap:

(Specification ART III # 60) The gap between the edge of the rudder and the skeg will not be closer than 10 mm (3/8").

Measurement:

Hang rudder on the boat and ensure the gap between rudder and skeg is 3/8" min. across the entire length.

2. Rudder Weight:

(Specification ART III # 60) The weight of the rudder with all hardware will weigh not less than 3.64 kg (8 lbs.)

Measurement:

Weigh the rudder and ensure rudder is no less than 3.64 kg (8 pounds).

3. Rudder Dimensions:

(Specification ART III # 59) The rudder will be built substantially of wood or glass reinforced plastic, and may be filled with foam or light wood, and will not be less than 17 mm (11/16") nor more than 22 mm (7/8") thick at the waterline and below, and will conform to dimensions on the Measurement Certificate.

Measurement:

The site committee can request that this measurement not be included or a random sampling procedure used. With the rudder hanging on the boat mark on the rudder the point where the bottom edge of the skeg aligns. This should be with the leading bottom corner of the rudder. Remove the rudder from the boat and place on the template, aligning the point on the rudder that aligned with the bottom edge of the skeg, with the marked point on the template. Ensure all dimensions are within the tolerances on the template. This will require the use of a tape measure to measure across the rudder at the indicated points.

SPINNAKER POLE

Specification ART III # 66:

The spinnaker pole when installed perpendicular to the front face of the mast in line with the centerline of the hull and pushed lightly against the mast fitting will not exceed 2083 mm (6'10") as measured to its extreme outer edge.

Measurement:

Hold the spinnaker pole at a 90 degree angle to the mast while attached and push gently toward the mast to extend the pole to its maximum distance, and measurement from the front edge of the mast, along to pole to the furthestmost edge of the pole should not exceed 6'-10". If multiple spinnaker eyes are present this must be repeated for each location on the mast for each spinnaker pole.

CENTERBOARD

1. Centerboard Thickness:

(Specification ART III #61) The centerboard may be constructed of steel or stainless steel with a maximum thickness of 8 mm (5/16") plus or minus 0.8mm (1/32") including coating, and shall not weigh more than 59.0 kg (130 lbs.), and shall be a uniform thickness.

Measurement:

Using the instrumented gauge, run it up and down the centerboard from both the leading edge and the trailing edge to ensure it meets the specification.

2. Angle of the Dangle:

(Specification ART III # 64) When fully lowered the centerboard must not extend more than 1372 mm (54") below the bottom of the keel measured perpendicular to the waterline. The forward position of the leading and lower edge of the centerboard shall not be less than 229 mm (9") aft of vertical measured from the centerline of the CB pin.

Measurement:

With the centerboard fully lowered, use the angle of the dangle measurement gauge, placed against the centerboard pin, ensuring that the upper portion of the gauge touches the hull, ensure that the centerboard measures within the device.

3. Centerboard Sharpness:

(Specification ART III # 63) The edges of the centerboard shall not be unduly sharp so as to cause a cut with moderate pressure.

Measurement:

With the centerboard fully lowered inspect all edges to ensure they are not unduly sharp. If it can take the hair off your hand or rubbing your hand up or down the board will produce a cut, it is too sharp.

4. Centerboard Slot Thickness:

(Specification ART I # 36) All boats built after October 1, 1999 will have a minimum slot width of 1/2" (12.70mm). Boats built earlier will have a minimum of 12mm (0.4724"). For all boats the maximum will be 3/4 inch. No boat may be altered in any way to achieve a narrower slot, unless it exceeds 3/4 inch. Boats which were built legally, but in which the slot has inadvertently narrowed without deliberate action by the owner, will be grandfathered.

Measurement:

Using a suitable measuring device, either pre-formed or a tape measure, measure the slot to ensure specifications are met.

A 1/2 inch ball or a 1/2 inch rod is necessary and recommended.

HULL

Specification (Article I number 30):

The radius of the bottom shall not be less than 2438.40 mm (8') and not more than 4572.00 mm (15').

Measurement:

While the boat is suspended in the air, use the hull template to run along the length of the hull. Ensure that when using the more rounded side, the hull only touches the template at the ends and light is visible between the hull and the template. When using the less rounded side, the template should "rock" on the hull.

SHROUD TENSION

Interpretation based on the Lightning Plans and Specifications Article II SPARS, 56. Upper shroud tension shall not exceed 113.4 kg (250lbs) with the forestay slack, backstay off and mast blocks removed.

SAILS

Measure against the sail templates.

MEASUREMENT FORMS

[Printable Fill-In Measurement Control Sheets](#)

Measurement Control Sheet #1				
Skipper:				
Hull Number:				
Sail number if different than hull:				
Measurement Certificate				
Measurement			OK?	Meas Initials
Mast Sticker	Number			
Mast Length	to Boom Band - 288" (24'-0") maximum			
	From top of halyard sheave groove to boom band			
	to Spinnaker Halyard - 63 5/8" minimum			
	From top of halyard sheave groove to spinnaker halyard			
	Overall Length - 329" (27'-5") plus/minus 1/4"			
	Bottom of main halyard sheave GROOVE (top side of sheave) at the top of the mast.			
Mast Foam				
Mast Band	Boom Alignment			
Boom Length	to Band - not more than 120"			
	Total - not more than 122"			
Spinnaker Pole #1	82" (6'-10") maximum			
Spinnaker Pole #2	If present			
Upper Stay Tension	250# maximum			
Class Hull Sticker	Present on Boat			
Rudder	1. Hang on boat and check to see leading bottom corner is in line with bottom edge of skeg.			
	2. Check to confirm gap between skeg and rudder is 3/8" minimum.			
	3. The weight of the rudder is no less than 3.64 kg (8 pounds).			
	4. Check profile against template.			
Safety Checks	1. Centerboard Preventer			
	2. Three life jackets			
	3. Fluke-type Anchor with 50' of line			
	3a. Anchor weight - 4 pound minimum			
	4. Throwable Cushion with whistle			
	5. Paddle			
	6. One-gallon bucket			
	7. Compass			
Hull Weight	Open inspection ports, check for water.			
	700# minimum			
	Correctors vs Certificate			
Bottom Arcs	Radius (8' minimum and 15' maximum). No concave surfaces.			
Centerboard	1. Angle of the dangle			
	2. Thickness 0.3125" plus/minus 0.0313"			
	3. Visually check shape for compliance with design and roundness of edges.			
	4. Slot width - 1/2" minimum			

Measurement Control Sheet #2			
Skipper:			
Hull Number:			
Sail number if different than hull:			
Measurement	Measurement Tolerance(s)	OK?	Measurer's Initials
Mainsail	1. Royalty Tag present		
	2. Measure against the template		
	3. Numbers and country designation correct		
Jib #1	1. Royalty Tag present		
	2. Measure against the template		
Jib #2	1. Royalty Tag present		
	2. Measure against the template		
Spinnaker #1	1. Royalty Tag present		
	2. Measure against the template		
	3. Numbers and country designation correct		
Spinnaker #2	1. Royalty Tag present		
	2. Measure against the template		
	3. Numbers and country designation correct		
Numbers should be uniform color, cloth, on both sides, and approximately 2" apart . If Graphics are present, they must have certification from the Measurement Committee.			

SITE MEASUREMENT PROCEDURE

1. Applicability:
 - a. For sanctioned regatta: all boats will follow this procedure and will be checked for compliance prior to the start of the regatta.
 - b. For non-sanctioned events it is at the discretion of the event's governing body. We assume that their intentions and the identification of the official gauge occur prior to the skippers meeting.
2. Gauges
 - a. Type: It is preferred that the latest gauge available is used.
 - b. Number of:
 - Preferred: A single new measurement gauge should be used to check all boats. It should be recalibrated after every 10 boats against two previously measured boats.
 - Alternative: For large events, multiple gauges may be used to measure boats. These gauges must be calibrated using the first three boats measured.

- c. Damaged gauges: If for some reason a gauge is damaged during the measurement process, a new gauge may be substituted but must be first calibrated against three previously measured boats.
- d. Definition of "calibrated": This measurement process is followed and:
 - i. The gauge(s) can be made to or interpreted to read the same.
 - ii. The gauge(s) can be made to or interpreted to read 250lbs.

The boat should be measured on the trailer with the top of the centerboard trunk as level as possible. All boats measured should have the same level and orientation to the wind as possible. (Boats can be spot-checked on the water as long as the condition closely approximated the condition when the boats were originally measured).

Assure that the blocks are out, backstay is off, forestay slack and base of mast is within specifications.

The upper shrouds MUST be attached. The lower shrouds can be attached or slack or unattached hanging freely.

Measure the upper and lower shrouds to make sure that they are within the specifications (250lbs). The measurement point should be approximately 2 to 3 feet from the deck.

Once the shrouds have been measured, the upper shrouds should be taped so that they cannot be adjusted. The measurer should mark the tape using a permanent pen with a distinguishing mark.

Spot checks can be performed during the regatta to check to assure that the tape on the upper shrouds has not been changed. If the tape has been altered then the boat can be re-measured using this procedure.

EXAMPLE OF MEASUREMENT PROCESS

This suggested organization has been proven to work efficiently and reduces the time required to take a boat through the measurement process. It is understood that every club has a different layout and space restrictions making it impossible to follow this organizations directly. Thus it is up to the individual organization to determine the best way to accomplish the measurement process.

1. Measurement should be divided into three distinct stations that easily flow into each other to facilitate the flow of boats though the process and a separate area for sail measurement. It is recommended that Station 1 be at one hoist, Station 2 be at hoist 2 and Station 3 be in an open area near the boat storage area.
2. Station one will require at a minimum 3 people and should conduct the following measurements; boat weight, rudder weight, anchor weight, rudder profile and rudder gap.
3. Station 2 will require at a minimum 4 people and should conduct the following measurements; Centerboard angle and thickness, centerboard slot thickness and bottom arcs.
4. Station 3 will require at a minimum 2 people and should conduct the following measurements; Mast length to band, mast overall length, spinnaker halyard location, check for foam in mast, boom length to band, boom overall length, check that top of boom line up with mast band, safety equipment, and stay measurement per approved procedure.
5. A separate station will be established for the measurement of sails, with a minimum of 3 people.

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Reviewed and revised 5/07 by Chief Measurer Bill Clausen