

# Ontario R-Class Association Official Rules of Measurement (2013)

## TABLE OF CONTENTS

- [1983 Lake Ontario R-Class Rule](#)
  - [I. Universal Rule](#)
  - [II. LOAD WATER-LINE PLANE.](#)
  - [III. HULL MARKS.](#)
  - [IV. L. in the Formula.](#)
  - [V. L.W.L.](#)
  - [VI. Concavities](#)
  - [VII. D. in the Formula](#)
  - [VIII. Draft.](#)
  - [IX. Freeboard](#)
  - [X. Rules of construction](#)
  - [XI. SAIL AREA](#)
    - [MAINSAIL](#)
    - [HEADSAILS](#)
    - [SPINNAKER](#)
    - [TOTAL SAIL AREA](#)
  - [XII. Sail Area limits](#)
    - [PERMANENTLY CURVED MASTS.](#)
  - [XIII. Certificates of measurements](#)
  - [XIV. Remeasurement and validation](#)
  - [XV. Rule modification](#)
- [2013 Lake Ontario R-Class Rule Amendments](#)
  - [A1.1 Freeboard](#)
  - [A2.1 Rules of Construction](#)
  - [A3 Sail Area](#)
    - [A3.1 Mainsail](#)
    - [A3.2 Headsails](#)
    - [A3.3 Spinnaker](#)
    - [A3.4 Masts](#)
  - [A4.1 Equipment Limitations](#)
  - [A5.1 Rule modification](#)

## 1983 Lake Ontario R-Class Rule

### ### I. Universal Rule

Lake Ontario Rule of Measurement for R-Class Yachts shall be rated according to the following formula:

Formula Measurement:

$$R = 0.18 \frac{L * \sqrt{S}}{\sqrt[3]{D}}$$

Maximum 20ft

(Eighteen percent of the Product of length multiplied by the square root of the sail area divided by the cube root of displacement.)

Measurement shall be made in accordance with the provision of this rule and shall not exceed 20 feet or less than 18.5 feet for an R-Class Yacht.

## **II. LOAD WATER-LINE PLANE.**

Established Load Water-Line Plane.

Before being measured, a yacht must have a "Load Water-Line Plane" established and prominently marked at the bow and stern and on each side of the yacht at the point of greatest load water-line breadth. Such plane shall be, as nearly as practicable, the plane of floatation when in racing trim.

This "Load Water-Line Plane" is to be the plane from which all calculation are made, including displacement, quarter-beam length, and draft. When once established it can not be changed before the beginning of the next racing season, unless the yacht has undergone extensive alterations in hull. Notice of such alterations must be filed with the Measurer at least two weeks prior to the day of any race in which the yacht may start.

## **III. HULL MARKS.**

The side marks required by Section II shall consist of two equal equilateral triangles whose apices touch the established plane of floatation and whose bases are parallel to such plane. The total vertical height of each side mark shall be one two hundredth (1/200) of the water-line length. The bow and stern marks shall be rectangular marks six (6) inches long, three (3) inches on each side of the centre line, and one half (1/2) inch in width, the long side in a vertical plane. The lowest point of the mark shall indicate the position of the established plane. The quarter-beam marks shall be circular, one inch in diameter, and the center of the circle shall indicate the point of measurement. Marks may be countersunk; on metal hulls they may be outlined by punch marks. All marks shall be of standard patterns approved by the Executive Committee of the Association.

When in trim, both under cruising and racing restrictions, the vessel floating on an even keel in

water of usual density, both side marks must be cut by the surface of the water. (This means that a yacht without change of rating may be 1/400 of its "Load Water-Line Length" deep or light as the case may be.)

#### IV. L. in the Formula.

The length used in calculating the measurement **L**. in the formula shall be the "Load Water-Line Length" plus one half of the excess of the quarter-beam length over the percentage of the load water-line length given by the formula,

$$\text{Percentage} = \frac{100}{LWL} \times QBL$$
$$L = LWL + 0.5 [ QBL - LWL \left( \frac{100}{LWL} \right) ]$$

#### V. L.W.L.

"Load Water-Line Length" (**L.W.L.**) is the distance in a straight line (after bridging as herein specified) between the point farthest forward and farthest aft in the established plane and likewise "Load Water-Line Breadth" is the extreme breadth in the established plane.

#### Q.B.L.

Quarter beam length (**Q.B.L.**) shall be measured in a line parallel with the middle fore and aft vertical plane at the distance from it equal to one quarter of the "Load Water-Line Breadth" and one tenth of this breadth above the "Load Water-Line Plane".

The "Load Water-Line Length" (**L.W.L.**) (20') of a yacht, in feet shall be limited to 110% of the maximum measurement plus 5.0'

Any excess of the actual "Load Water-Line Length" (**L.W.L.**) above this limit shall be added to the measurement.

#### VI. Concavities

Any concavity at the plane of measurement of the quarter-beam length, in either the quarter-beam buttock or the tenth-beam water-line, shall be bridged by a straight line of a length equal to one third (1/3) of the greatest load water-line beam. The center of such straight line to which the quarter-beam length shall be measured, shall be placed horizontally opposite the point of measurement.

Any local concave jog or notch (curved or angular) at the plane of measurement of either end of the load water-line length, shall be bridged by a straight line and the **L.W.L.** taken to the intersection of such lines with the established load water-line plane. The stem or stern profile lines, where they cross the load water-line plane may be fair easy curves; but any concavity in the stem line shall be bridged by a straight line equal to fifteen percent (15%) of the load water-

line plane. The load water-line (**L.W.L.**) shall be measured to the intersection of this line with the established load water-line plane.

## **VII. D in the Formula**

Displacements of yachts shall be obtained by weighing upon scales approved by the Association.

For the purpose of determining a yacht's displacement by weighing the weight of a cubic foot of water shall be regarded as sixty-four (64) pounds of salt water and sixty-two and four tenth (62.4) pounds in fresh water.

When the displacement of a yacht has been properly ascertained, it need not be redetermined except in case of specific protest or upon notice as provided for in the second paragraph under the heading "Established Load Water-Line Plane".

There shall be no limit on the on the actual displacement of yachts, but the cube root of the displacement, **D**, as used in the measurement formula shall never exceed

20% of the actual **L.W.L.** plus 0.50.

If the actual displacement is smaller than that allowed by this limit, the actual displacement shall be used in computing the measurement; if the actual displacement is greater, then the limiting value of the cube root of **D**, shall be used in computing the measurement.

## **VIII. Draft.**

The limit of draft of yachts shall be in feet: sixteen percent (16%) of the L.W.L. plus one and three quarters (1.75).

Any excess of draft as per above formula, shall be multiplied by three (3) and added to the measurement.

## **IX. Freeboard**

The freeboard in feet, to the top of the cover board, at the mid point of the established load water-line plane shall not be less than five percent (5%) of the load water-line plus six (0.6) or 1.95 feet.

If the actual freeboard at this point be less than this limit, the deficit shall be added to the measurement.

Any yacht designed and built before June 1, 1983 will not be subject to a freeboard penalty.

## **Sheer**

The design sheer shall be fair, continuous concave curve, and the tumble home on each side of a yacht shall not exceed two percent (2%) of the extreme beam.

## **X. Rules of construction**

### **All yachts shall be built:**

- Wooden construction (planked on frames)
- Molded plywood
- Resin reinforced fiberglass
- Aluminum
- No bow sprits shall be allowed

## **XI. SAIL AREA**

The Measurer shall make the following measurements, calculate the sail area there from in accordance with the following formula, and the square root of this area shall be the in the measurement formula. After having been officially measured, a yacht shall not make any alterations in her sail plan without the written notice to the Association embodying a request for remeasurement.

### **MAINSAIL**

**B.** Length of boom measured from after-side of mast to outboard end, including fittings or ornamental caps or to the inside edge of a black band, one (1) inch wide, painted on the boom, indicating the maximum out-haul position of the mainsail foot. In case of any device or extension by means of which the out-haul may be extended beyond the end of the spar, this measurement shall be taken to the extreme possible of out-haul device.

**P1.** A perpendicular to be measured along the after-side of the mast from the top of the highest sheave in the mast or the highest juncture of the mast with the eyebolt (centre of eye) or pennant of the highest block or the bottom edge of the black band, one (1) inch in width painted on the spar, used for sails aft of the mast; to the upper side of the boom when touching the lower part of the goose-neck or on the lower stopper of the boom down haul track, which points shall be defined by the upper edge of a black band at least one (1) inch in width painted on the spar.

**R.** The horizontal distance from the after-side of the mast, at the upper side of the boom, to a plumb-line suspended from the upper point of measurement of **P1.** when the yacht is floating parallel to the established plane.

The area of a triangular mainsail shall be obtained from the above the above measurements by the formula:

### **HEADSAILS**

**J.** The J to be measured from the foreside of the mast to where the line of the foremost headsail, when extended, cuts the hull.

**P2.** A perpendicular to be measured along the foreward side of the mast from the higher of the following points; the top of the highest heave in the mast used for headsails or spinnaker, or the highest juncture of the mast eye-bolt (centre of eye) or pennant of a halyard block used for headsails or spinnaker; to the deck. But in no case shall the upper point of measurement be taken below the point of intersection of the line of the luff of the foremost headsail, when extended, and the mast.

## **SPINNAKER**

The length of the spinnaker boom shall be limited to fifty percent (50%) of the entire baseline determined by the sum of **B + J + the fore and aft dimension of the mast at the black band** (gooseneck). Any excess in the length of the spinnaker boom over the above limit shall be added to the J of the fore-triangle when computing the area of the headsails.

In all the yachts the area of the headsails shall be obtained by multiplying **J** by **P2.**, dividing the product by two (2) and taking eighty-five percent (85%) of the result.

Formula:  $0.85 \times P2 \times J$

## **TOTAL SAIL AREA**

The total sail area for the purposes of the measurement shall be the sum of the areas of mainsail and headsails as calculated by the above method.

The number of battens in a single sail shall be limited to four (4). Lengths of battens shall not exceed the following: Upper and lower battens 10 percent (10%) of the length of the foot of the sail plus one (1) foot: intermediate battens twelve percent (12%) of the length of the foot of the sail plus one (1) foot.

A spinnaker may have no headstick or board nor any contrivances for extending the sail to other than a triangular shape.

In case a yacht shall carry a forward or jibstay strut, the actual area between the stay and the mast shall be calculated, and eighty-five percent (85%) of the excess of such area over that of the foretriangle shall be added in computing the total area for determining the measurement.

## **XII. Sail Area limits**

Not more than eighty-two percent (82%) of the sail area shall be abaft of the mast.

Not more than fifty percent (50%) of the sail area shall be forward of the mast.

The perpendicular **P1** shall be limited to ninety-five percent (95%) of the mast height.

The perpendicular **P2** shall be limited to eighty-seven and one half percent (87.5%) of

**P1.**

Any excess of **P1** or **P2** shall be multiplied by two (2) and added to the respected **P**.

The height of triangular mainsails shall be limited as follows:

The distance in feet from the deck, at the afterside of the mast, to the top of the highest sheave in the mast, or to the juncture of the mast with the eye-bolt or pennant of the highest halyard block, shall not exceed

$$1.7 + 6 \text{ feet}$$

Should the limit be exceeded, the excess shall be multiplied by two (2) and added to the Perpendicular **P1** in computing the sail area.

The head-board or club shall not exceed three percent (3%) of the length of the boom.

#### **PERMANENTLY CURVED MASTS.**

Permanently curved masts are prohibited except in yachts which have been so equipped prior to April 30 1927. Rotating masts, double luffed sails and similar contrivances are prohibited.

### **XIII. Certificates of measurements**

The Measurer, or his assistants, shall personally measure the spars, the load water-line and quarter-beam lengths, as established and marked in accordance with the section headed "Length". He may accept drawings, dimensions and calculations of any or all other specified measurements when certified to by the designer; but previous to issuing the certificate of measurement, he or his assistants, shall personally verify the line of floatation. Certificates of measurement shall give all the principal elements of length, sail area and displacement used in computing the rating, and shall specify whether obtained from actual measurements, weighing or designer's certificates. Any request on the part of the Measurer to the designer for calculations of displacement or other factors must give lengths of overhangs, as actually measured, and shall be accompanied by a sketch sufficient to clearly show the location of the extreme forward and after points of measurements relative to the stem head, taffrail and established load water-line plane.

An error in measurement discovered at any time prior to the first day of November shall be corrected, and the results of that season's races made to conform to the correct measurement.

Certificates of measurement, subject to the foregoing and subject to the changes effected through remeasurement, shall be valid for two (2) years only from the date of issue.

Measurers shall not measure:

Yachts which they themselves designed or built, or in the construction or alteration of which

they have, in any respect, taken part.

Yachts which have been built by firms in which they have business interest.

Yachts in which they are themselves the owners or part owners.

## **XIV. Remeasurement and validation**

Yachts shall be measured and a new certificate issued or the existing certificate validated for a further two (2) year period providing the yacht is inspected by the official measurer.

At the expiration of two (2) years from the date of the last certificate.

Should the Association so direct on account of protest: or because, in their opinion, infringement of the measurement rule or irregularity in the certificate exists.

Upon notification by the Owner or the Association that changes have been made in the yacht affecting her **L.W.L.** or sail plan. (Obligations of Owner Respecting Certificate – The requirements for remeasurement make it incumbent on the owner to notify the Association in writing of the invalidity of the certificate of his yacht. It is therefore especially incumbent on the owner, or his representative, to ascertain from time to time by inspection of the marks, whether the immersion of the yacht has become from any cause whatever such as to render the certificate invalid).

In the event of remeasurement, verification of the line of floatation and/or load water-line plane shall be sufficient evidence that displacement, quarter beam length and draft have not been changed since the last measurement and such factors need not be rechecked.

## **XV. Rule modification**

The acceptance and any further alteration to the measurement rules may only result from a unanimous vote of the Association in favour thereof.

# **2013 Lake Ontario R-Class Rule Amendments**

The following amendments will overrule any of the above restrictions or allowances.

## **A1.1 Freeboard**

Any yacht designed before June 1. 1983 will not be subject to a freeboard penalty.

## **A2.1 Rules of Construction**

The material of mast, winches, and (or) boom can not be carbon fibre or similar composites. Exceptions to this rule are for mounting accessories, spinnaker poles, floorboards, soft padeyes, and the like.



## **A3 Sail Area**

### **A3.1 Mainsail**

The maximum mainsail half height width shall be limited to 65% of boom (E) measurement, and the Maximum Mainsail 3/4 height width 38% of boom (E) measurement. Full length battens shall be permitted. In no event shall the number of battens exceed 4 per mainsail.

### **A3.2 Headsails**

The genoa foot measurement shall in no event exceed 19 ft. Such measurement shall be taken from the foremost edge at the tack to the furthest point at the clew of the sail. Boats R13, R21, and R15 shall be allowed a maximum foot measurement of 21.75 ft provided these yachts do not change their J (mast to forestay) or E (Length of Boom) effective Jan 1st, 2013. All alterations to the fleet after Jan 1st, 2013 shall conform to the 19' rule.

### **A3.3 Spinnaker**

The maximum Luff dimension shall be the square root of J squared plus P2 squared

$$\sqrt{J^2 + P2^2}$$

All spinnakers must be symmetrical, no asymmetric spinnakers shall be permitted during racing.

### **A3.4 Masts**

Maximum Mast Height to be 1.7 times square root of sail area + 6 ft AND not to exceed 47 ft from deck.

$$MaxMastHeight = 1.7\sqrt{SA} + 6$$

## **A4.1 Equipment Limitations**

The spinnaker tack may be lead to any point on the centreline of the deck forward of forestay landing, the spinnaker may be flown without a pole.

## **A5.1 Rule modification**

The acceptance and any further alteration to the measurement rules may only result from a 2/3rds majority vote of the Association in favour thereof.

### **Note:**

For future records, the original document, adopted by the Ontario R-Class Association in 1983 was scanned and is available as a JPEG file. This word Document in its entirety was retyped by Henry and Vicki Piersig, owner of the yacht Fantome, on Aug. 20. 2009. When applicable, some

spelling errors have been corrected. This document was then reformatted and amendments were added by Ryan Marr, owner of the yacht Archer on August 19th, 2013.