

AC Class Rules

[AC Class Measurement.xls](#) - This is a MS Excel file of a form which contains the formula used in measuring A/C class yachts. This would give a boat a rating once properly completed. Updated

1.0 GENERAL

1.1 The purpose of the AC Class Rule is to encourage the development and Corinthian racing of 1/12th scale radio-controlled models of contemporary America's Cup yachts.

1.2 It is the intent of the AC Class Rule to produce model yachts which replicate the true-to-scale appearance, performance, and construction integrity of the America's Cup yachts, to accurately measure the true performance potential of AC Class yachts, and to provide equitable model-yacht racing.

1.3 It shall be assumed that anything not specifically restricted by this rule is permitted, provided that it does not violate the intent or spirit of this rule, particularly rule 1.2.

1.4 Any yacht attempting to circumvent the spirit of this rule shall be denied a rating certificate and summarily dismissed from competition.

2.0 DEFINITIONS

2.1 AG: Aft Girth; measured around the AGS between points on the hull port and starboard located 3.00 inches above the lowest point of AGS.

2.2 AGC: Aft Girth Correction as per rule 3.5.

2.3 AGS: Aft Girth Station; located where the centerline of the hull aft intersects a plane 0.66 inches above the measurement waterline.

2.4 B: Maximum measured Beam.

2.5 BP: Beam penalty as per rule 3.6.

2.6 D: Maximum measured Draft.

2.7 DP: Draft penalty as per rule 3.7.

2.8 DSP: actual measured weight.

2.9 E: Mainsail Foot Length; measured along the boom from the forward edge of the measurement band to the aft side of the mast as per rules 7.8 and 9.7.

2.10 FG: Forward Girth; measured around the FGS between points on the hull port and starboard located 4.00 inches above the lowest point of FGS.

2.11 FGC: Forward Girth Correction as per rule 3.4.

2.12 FGS: Forward Girth Station; located where the centerline of the hull forward intersects a plane 0.66 inches above the measurement waterline.

2.13 FP: Freeboard penalty as per rule 3.8.

2.14 GENOA: any head sail having a foot length greater than J and less than or equal to (J+7.75) inches.

2.15 I: Height of the fore-triangle; measured along the mast from the intersection of the headstay with the forward side of the mast to the deck or projected deck surface.

[*Typographical error on website corrected to actual rule, Nov 2002*]

2.16 J: Base of the fore-triangle; measured along the deck, with the mast in its forward-most position, from the forward side of the mast to the intersection of the headstay or projected headstay with the deck or projected deck surface.

2.17 JIB: any headsail having a foot length less than or equal to J inches.

2.18 L: Rated length as per rule 3.2.

2.19 LBG: Length between Girth Stations; measured from FGS to AGS.

2.20 LM: Measured length as per rule 3.3.

2.21 MEASUREMENT TRIM: the yacht in normal sailing configuration, with all normal racing gear in place, less spars, sails, and standard rigging.

2.22 ML: Mainsail Leech; measured from the top-forward corner of the headboard to the clew.

2.23 MR: Mainsail Roach: the maximum mainsail roach measured perpendicular to the ML line.

2.24 MRA: Mainsail Roach Area as per rule 3.11.

2.25 P: Mainsail Luff Length: measured along the mast from the bottom edge of the top measurement band to the top edge of the bottom measurement band as per rules 7.8 and 9.8.

2.26 S: Rated Sail Area as per rule 3.9.

2.27 SM: Measured Sail Area as per rule 3.10.

3.0 FORMULAS

3.1 Rating; which shall be 75 maximum
$$= (L + (1.25 * S^{1/2})) - 9.80 * (DSP * 27)^{1/3} * 1.95$$

3.2 $L = LM * (1 + 0.03 * (LM/3.28 - 21.20)^8) + BP + DP + FP$

3.3 $LM = LBG + FGC + AGC$

3.4 FGC = the greater of 1.00 or $(1.25 * (FG - 8.25))$

3.5 AGC = the greater of 5.25 or $(0.75 * (AG - 5.00))$

3.6 BP: if B is less than 18.00 and greater than 16.00 then BP = 0.00.

If B is greater than 18.00 then BP = $4 * (B - 18.00)$. If B is less than 16.00 then BP = $4 * (16.00 - B)$.

3.7 DP = the greater of 0.00 or $(4 * (D - 16.00))$.

3.8 FP: If freeboards meet or exceed 4.90 at the FGS, 4.10 half way between FGS and AGS, and 4.00 at the AGS, then FP = 0.0; otherwise FP = $4 * (\text{the sum of the deficiencies})$.

3.9 S = $SM * (1 + 0.01 * (SM^{1/2} * 0.388 - 16.90)^8)$.

3.10 SM = I * J/2 + P * E/2 + MRA.

3.11 MRA = ML * MR * 0.67.

4.0 HULL

4.1 Yachts shall be monohull configuration.

4.2 The sheerline in profile shall be a continuous fair concave curve from the bow to AGS.

4.3 The radius of the hull-deck joint shall not exceed 0.32 inches.

4.4 Deck crown, not including cockpits, coamings, or hatches, shall not exceed 6 percent of the beam at any station, and shall not be negative.

4.5 Tumblehome shall not be allowed.

4.6 Hollows shall not be allowed on the surface of the hull except that an appendage may have fairing radius not to exceed 0.82 inches.

4.7 Movable ballast shall not be allowed.

4.8 Yachts in measurement trim shall not weigh less than 20.40 pounds nor more than 31.90 pounds.

4.9 Yachts in measurement trim, less keel, shall not weigh less than 9.00 pounds.

5.0 APPENDAGES

5.1 Keels shall be removable for weighing the hull, but fixed while racing.

5.2 Retractable appendages shall not be allowed.

5.3 Only two movable surfaces shall be allowed.

5.4 No part of any appendage shall extend beyond either Girth Station.

6.0 SPARS and RIGGING

- 6.1** Yachts shall be sloop-rigged with a single mast.
- 6.2** The mast shall not be permanently bent or rotating.
- 6.3** The mast shall not move more than 1.00 inches fore and aft on deck.
- 6.4** The mast shall not be higher than 96.00 inches above deck.
- 6.5** The mast, jib club and spinnaker poles shall not exceed 1.00 inches in diameter.
- 6.6** The masthead crane shall not extend more than 2.00 inches beyond the aft side of the mast.
- 6.7** Spinnaker poles shall not extend more than $(J * 1.35)$ inches from the mast.
- 6.8** The top of the boom at the mast shall not be more than 5.75 inches nor less than 3.50 inches above the deck or projected deck surface.
- 6.9** The boom shall not exceed 2.00 inches in depth or 1.30 inches in width, and the top of the boom shall be straight.
- 6.10** Spare spars shall be substantially identical to primary spars.
- 6.11** The measurement of I shall not exceed $(0.80 * (P + 5.75))$ inches.

7.0 SAILS

- 7.1** Headboards shall not exceed 0.82 inches in height or width.
- 7.2** Battens shall not be allowed in Genoas or Spinnakers.
- 7.3** Battens shall be limited to 10 in number per sail in Mainsails and Jibs.
- 7.4** Battens shall not extend beyond the leech of any sail.
- 7.5** The maximum girth of any Genoa or Jib, measured between the mid-points of the luff and leech, shall not exceed 60 percent of the length of the foot.
- 7.6** Mainsail foot rounds shall not exceed 2.5 inches in depth.
- 7.7** The aspect ratio of (P / E) shall not exceed 3.60.
- 7.8** No part of the Mainsail shall at any time extend beyond the inner edges of the measurement bands as prescribed by rules 9.6 and 9.7.
- 7.9** The Mainsail shall display the class insignia of AC over a bar above the assigned registration number. Insignias and numbers shall be three inches tall.
- 7.10** All sail leeches shall be continuous fair curves.

7.11 No suit of sails shall exceed the profile of the largest suit.

7.12 No part of any sail at any time exceed 0.10 inches in thickness.

8.0 CONSTRUCTION

8.1 Decks and Hulls shall not be translucent.

8.2 Fabric or other non-rigid decks shall not be allowed.

8.3 No construction material shall be more dense than pure lead.

8.4 All construction materials shall be commercially available.

9.0 MEASUREMENT

9.1 All measurements shall be taken in inches and pounds, and decimals thereof, rounded to the nearest one decimal place of accuracy.

9.2 All floating measurements shall be taken in fresh water.

9.3 Yachts shall be weighed and measured in measurement trim.

9.4 Yacht owners shall provide rigid templates of the FGS and AGS as per the diagrams. Templates shall exactly fit the hull in a transverse vertical plane corresponding to the girth stations. These templates shall be used to measure the FG, AG, and LBG.

9.5 Yachts shall have both girth stations marked on the hull, on the centerline and at both ends of the girths, such that the marks are clearly visible with the girth templates in place.

9.6 The mast shall have measurement bands 0.10 inch wide corresponding to the limits of P as per rules 2.25 and 7.8. P shall be measured from the bottom edge of the top band to the top edge of the bottom band.

9.7 The boom shall have a measurement band 0.10 inch wide located at the aft limit of E as per rules 2.9 and 7.8. E shall be measured from the forward edge of the band to the aft side of the mast.

10.0 CERTIFICATION

10.1 No yacht shall be considered registered until a rating certificate has been completed and endorsed by a designated measurer, and forwarded in duplicate to the Class Secretary. Upon approval, the Class Secretary shall return one endorsed copy to the owner.

10.2 Yachts shall be measured by designated measurers, who shall be appointed by the Class Secretary. If a designated measurer is not available, a yacht may be measured by its owner; however, such a yacht shall be re-measured by a designated measurer prior to participation in any National or Divisional class championship event.

10.3 No yacht shall have more than one valid rating certificate at a time.

10.4 Any change to a yacht which affects any measurements on the yachts rating certificate shall render the certificate invalid, and shall be re-measured and a new rating certificate obtained.

10.5 Once a yacht has entered an event, no modification to or replacement of the yacht's hull or appendages shall be allowed during that event.

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[*Typographical error in 2.15 on website corrected to actual rule, Nov 2002*]