CMA Rating Formula version 2010

$R = (SR \times LR / WR)^{0.63} / 2.395$

SR: rated sail area
LR: rated length
WR: rated weight

$SR = 0.575\ (0.8 \times S + 1.2 \times SS)\ [1 - 0.25 / AR] + SL$

S (measured sail area) = main + mizzen + staysl(s) + largest jib areas + 1.5 x rotating mast area

SL (light air sail or spinnaker allowance) = $0.02 \times L^2$ (if one spinnaker, mid-girth fraction $\geq$0.7, alone)

SL = (0.0025 + screacher/geneker mid-girth fraction / 40) x L^2 (if one screacher/geneker alone) A mid-girth fraction less than 0.5 will be considered to be 0.5 for this calculation.

SL = $0.025 \times L^2$ (if both screacher/geneker and spinnaker, no sail number limitation)

SL = $0.0225 \times L^2$ (if two or more spinnakers without screachers, or two or more screachers without spinnakers, and the two sails are designed for different wind range/ angles). For this definition of two screacher/genekers or two spinnakers, a sail with MGF=0.7 (+/- 1%) could be considered either a screacher/geneker or a spinnaker.

L (Effective spin hoist) = largest fore-triangle luff length (spin hoist) + 0.9 x bowsprit length

SS (reference sail area based on stability) = $0.23\ \{[(BOA + HRC)^2 + 0.1\{(LOAS + LOAP) / 2\}^2] \times [W + WB + 350]^2\}^{1/3}$

LOAS = overall length of starboard hull

LOAP = overall length of port hull

WB = water ballast

BOA = beam overall

HRC (hiking rack correction) = (350 x RB) / (0.5W + 175)

Crew weight allowance of 350 lb is assumed (this number will be changed in future if necessary).

RB (hiking rack beam) = the maximum distance between the outer edge of the hiking rack and the outer edge of the hull to which the rack is attached. If different racks are deployed on the two sides of the boat, the larger of the two rack beams is the RB

AR (aspect ratio) = $2 / S\ [1 / H^2 + 1 / 25(DE_1^2 + DE_2^2 + DE_3^2)]$

H (rig height, or sail plan height) = vertical distance between the highest and lowest points of the sail plan

DE (effective draft for each keel/center board) = $D\ [(BWL + D) / (0.5BWL + D)]$

D = center board draft or max draft for each hull

BWL = waterline beam for each hull

$LR = [0.7\ (LWL) + 0.3\ (LOA)]$ for the longest hull

LWL = waterline length

$WR = 0.5\ [W - FLV + [0.1 \times LR^3 \times (W - FLV)]^{0.5} + 0.5\ (0.1 \times LR^3)(1 + DR) + 20\ (0.1 \times LR^3)(PI)(DP / LR)^2]$

W (measured weight) = dry weight (no fuel, no water, no food, but include normal sailing gear + 350 Lb for crew weight allowance)

This is a Fixed Rating Option for the treatment of the lifting foil (, which is still under development).
FLV (foil lift vertical) = FA x Cl x [0.15 x (LOAS + LOAR)] ^2. (The speed factor 0.15 to be adjusted as necessary.)

Cl = Lift coefficient of the foil section (use 0.2, adjust if necessary).

DR (draft ratio) = $[DK_1 + DK_2 + DK_3] / LR$
DK = board up keel draft for each hull
PI = propeller installation index
DP = propeller diameter

Adjustment factor = an arbitrary % assigned to each boat

CMA Rating = R x (100 + adjustment factor) / 100

The Rating Committee may chose to assume that the boat dimensions are the same as that for a reference boat. A reference boat is a boat of the same make and model that has been measured.

The Rating Committee may chose to assume that the sail area is similar to that for a reference boat. In this case, S = 1.01 x S(ref), unless there is an active one-design class fleet exists for the boat in question and the sails used are "class legal", in which case, S is the maximum sail area for the class.

The Rating Committee may chose to use an estimated weight it considers appropriate in rue of measuring the weight "W" when a measured weight is unavailable. Care should be taken that the estimated weight is unlikely to be an underestimate. Alternatively, the Committee may assume that the weight is the same as that for a reference boat. In this case, W = 0.99 x W(ref).

A spinnaker is defined as a foresail having a midgirth over 70% of the foot.

A screacher/genneker is defined as a foresail, luff of which is not attached to the forestay and having a midgirth less than 70% of the foot. If a foresail that is judged to be designed for the primary use for upwind sailing meet this definition of a screacher/geneker, the Rating Committee reserves a right to override this definition and classify the sail as a jib.

A second screacher/genneker that is set using the tack and/or halyard attachment points different from the largest screacher/genneker will be considered a jib.

Only one jib can be deployed at a time. If the second jib is deployed in conjunction with the primary jib, it will be considered as a staysl and the area will be added to the measured sail area.

"L", the effective luff length of a spinnaker is the sum of the largest fore-triangle luff length and 90% of the bowsprit length.

The "largest fore-triangle luff length" is the distance between the foremost tack line block and the uppermost foresail halyard block.

The "bowsprit length" is the distance between the position of the forestay at the deck and the foremost tack line block on the bowsprit. A portion of an oversized spinnaker pole will be considered as a bowsprit. In this case, the "bowsprit length" will be the difference between the pole length and the fore-triangle foot length. If a boat is equipped with a foresail tack line traveler that effectively extend the tack position beyond the forestay, the boat is considered to have a bowsprit. In this case, the "bowsprit length" will be the difference between the longest possible distance between the traveler and the mast, and the fore-triangle foot length.

The propeller installation index (PI) is determined from the table below.

		Propeller type		
		conventional	folding	feathering
	A1	A2	A2	A2
Installation type				
non-exposed shaft	0.5	B – 2	0	0
exposed shaft	1.5	B	0.5	B / 4
in aperture	1	B – 2	0	(B – 2) / 4
strut drive	0.8	B	0.5	B / 4

B = number of blades
$0 < A2 < 4$

PI = A1 + A2

Lighter and shorter boats suffer from the wave conditions frequently encountered on the Bay, and accordingly, special adjustment allowance has been given to a few boats. Current special adjustments are: Seawind 24, -4.5%; F24s, -1.5%; Catri24, -10%.