2026

ORC

The Equal Chance to Win

OFFSHORE RACING CONGRESS

ORC Multihull Rating Systems

ORCmh International & ORCmh Club

Margin bars denote rule changes from 2025 version.

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ORC MULTIHULL RATING SYSTEMS

ORCmh International Club

2026

Offshore Racing Congress

www.orc.org

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Introduction

ORC Multihull Rating Systems (ORCmh International and ORCmh Club) use the International Measurement System (IMS) as a measurement platform and the ORCmh Velocity Prediction Program (VPP) to rate boats of different characteristics in size, hull and appendages shape and configuration, rig and sails measurement, propeller installation and many other details affecting their predicted sailing speed.

Boat ratings are matrix of time allowances calculated from the predicted boat speeds for 9 different true wind speeds (4, 6, 8, 10, 12, 14, 16, 20 and 24 knots) and 8 true wind angles (52°, 60°, 75°, 90°, 110°, 120°, 135°, 150°), and two optimum angles on sailing upwind and downwind for which VMG (Velocity Made Good) is maximized.

From this matrix of predicted performances, various scoring options are derived from the rating matrix adapting the scoring to the course conditions.

The VPP is explained in detail in the VPP Documentation guide and is the basis of the ORCmh rating systems. A VPP simulation software package can be purchased to study the theoretical boat speeds derived from the calculations when using IMS measurements. Details and order forms are available at the ORC website: www.orc.org.

Users of ORC Multihull Rating systems should consult the Administrative part of the IMS (Part A) for appropriate use of abbreviations, definitions, and symbols.

ORCmh International certificates may be issued for boats which are completely measured in accordance with the IMS and complying with the requirements of the IMS Rules, as well as those expressed in this document.

ORCmh Club certificates may be issued with less than complete IMS measurement where measurement data may be declared and/or obtained from other sources. The Organizing Authority of any race or regatta will specify whether ORCmh International or ORCmh Club certificates are required for entry, but both certificate types can be mixed in any race, being fully compatible.

The following measurements with appropriate IMS rules are used for the ORCmh Rating systems:

Hull and appendages in the symmetry plane

	OFF file	B3
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Rig

P	Mainsail Hoist	F2.1
IG	Forestay Height	F3.1
ISP	Height of Spinnaker Hoist	F3.2
BAS	Boom Above mast heel point	F3.5
MDT1	Max. Transverse Mast	F4.1
MDL1	Max. Fore-and-Aft Mast	F4.2
MDT2	Min. Transverse Mast	F4.3
MDL2	Min. Fore-and-Aft Mast	F4.4
TL	Taper Length	F4.5
MW	Mast Width	F4.6
GO	Forestay Outrigger	F4.7
E	Mainsail Foot	F5.1
BD	Boom Diameter	F5.2
J	Foretriangle Base	F6.1
SFJ	Stem to Forward End of J	F6.2
FSP	Forestay Perpendicular	F6.5
SPL	Spinnaker Pole Length	F7.1
TPS	Tacking Point of Spinnaker	F7.2
MWT	Mast Weight	F8.1
MCG	Mast Vertical Center of Gravity	F8.3
MCA	Mast Cant Angle	F8.4
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Mizzen Rig

PY	Mainsail Hoist Mizzen	F10.1
BAMY	Boom Above Mast Heel Mizzen	F10.1
MDT1Y	Max. Transverse Mast Mizzen	F10.1
MDL1Y	Max. Fore-and-Aft Mast Mizzen	F10.1
MDT2Y	Min. Transverse Mast Mizzen	F10.1
MDL2Y	Min. Fore-and-Aft Mast Mizzen	F10.1
TLY	Taper Length Mizzen	F10.1
EY	Mainsail Foot Mizzen	F10.1
BDY	Boom Diameter Mizzen	F10.1
IY	Height of Mizzen Staysail Hoist	F10.2
EB	Distance Between Masts	F10.3

Sails

MHB	Mainsail Top Width	G2.1
MUW	Mainsail Upper Width	G2.1
MTW	Mainsail 3/4 Width	G2.1
MHW	Mainsail 1/2 Width	G2.1
MQW	Mainsail 1/4 Width	G2.1
MHBY	Mizzen Top Width	G3
MUWY	Mizzen Upper Width	G3
MTWY	Mizzen 3/4 Width	G3
MHWY	Mizzen 1/2 Width	G3
MQWY	Mizzen 1/4 Width	G3
HHB	Headsail Top Width	G4.1
HUW	Headsail Upper Width	G4.1
HTW	Headsail 3/4 Width	G4.1
HHW	Headsail 1/2 Width	G4.1
HQW	Headsail 1/4 Width	G4.1
HLU	Headsail Luff	G4.1
HLP	Headsail Perpendicular	G4.1
SHW	Symm. Spinnaker Mid Width	G6.4
SFL	Symm. Spinnaker Foot	G6.4
SLU	Symm. Spinnaker Luff	G6.4
SLE	Symm. Spinnaker Leech	G6.4
SHW	Asymm. Spinnaker Mid Width	G6.5
SFL	Asymm. Spinnaker Foot	G6.5
SLU	Asymm. Spinnaker Luff	G6.5
SLE	Asymm. Spinnaker Leech	G6.5
QCD	Quadrilateral Clew Diagonal	G7.2
QFL	Quadrilateral Sail Foot Length	G7.2
QLE	Quadrilateral Sail Leech Length	G7.2
QLH	Quadrilateral Sail Head Length	G7.2
QLM	Quadrilateral Leech Median	G7.2

1. LIMITS AND DEFAULTS

100 General

100.1 The IMS Measurement offset file (.OFF) of the hull and appendages is processed by the Lines Processing Program (LPP) which calculates hydrostatics and all hull characteristics required by the VPP. The calculations of the main hydrostatic data are explained in principle below, while the exact formulations are defined in the VPP and its documentation.

100.2 Default water specific gravity ***SG*** shall be 1.0253. FA and FF shall be adjusted from the measured freeboards ***FAM*** and ***FFM*** depending on the difference between ***SG*** at the time of measurement and the default value defined above. All hydrostatic calculations are then made using the flotation plane in nominal seawater, i.e. with default specific gravity.

100.3 Sailing Trim shall be the plane of flotation derived from Measurement Trim as in 100.2 with the addition of weight to represent crew, sails, gear, declared tankage and any other equipment listed in the measurement inventory as recorded in the certificate.

100.4 DSPM and DSPS are the displacements calculated from the volume resulting from the linear integration of the immersed section areas obtained from the hull lines of the Offsets and the freeboards afloat, adjusted to the standard ***SG,*** in Measurement Trim and Sailing Trim respectively.

100.5 VCGD is the vertical center of gravity distance from the datum line in the hull offset file, while VCGM is the vertical center of gravity from the measurement trim waterline.

101 Crew Weight

101.1 The crew weight may be declared by the owner.

101.2 If the crew weight is not declared it shall be taken as default calculated to the nearest kilogram as follows:

$$CW = 25.8 \cdot LOA^{1.1}$$

101.3 The possibility of moving the assumed crew position beyond the IMS sheerline is taken into account through crew extension (CEXT) factor.

102 Hull

102.1 Age Allowance (AA) is the rating assessment calculated as decrease of rated boats speeds for 0.0325% for each year from Age or Series Date, whichever is earlier, to the current rule year up to maximum of 20 years (0.65%).

102.3 RS is the rating assessment for different rig and sails controls with or without use of the non-manual power (NMP). It is applied as a percentage to all time allowances for all wind speeds and directions and cannot be more than 1.5%. The RS value increases rated boat speeds and is calculated from the effect of each of rig and sails controls in percentages follows:

Rig		*Sails*	
Inner stay	0.017	Vang NMP	0.032
Inner stay adjustable	0.034	Outhaul NMP	0.016
Inner stay adjustable NMP	0.051	Halyards NMP	0.032
Forestay adjustable turnbuckle	0.034	Mainsail cunningham NMP	0.016
Forestay adjustable	0.034	Headsail cunningham NMP	0.032
Forestay adjustable NMP	0.136	Mainsail traveller NMP	0.065
Backstay adjustable	0.085	Sheets NMP	0.065
Backstay adjustable NMP	0.136	Tack line NMP	0.032
Running backstay adjustable	0.085	Headsail track NMP	0.032
Running backstay adjustable NMP	0.136	Spinnaker retriever	0.032
Checkstays adjustable NMP	0.068		

Base of the mast adjustable	0.034

103 Appendages

Hull interceptors mounted on the transom to redirect the water flow to change the attitude of transom shall not be movable.

104 Propeller

104.1 PIPA shall be the propeller installation projected area calculated on propeller type, installation, and measurements.

104.2 For twin propeller installation, PIPA is doubled.

105 Rig

105.1 Boom diameter by default shall be 0.06****E***. If ***BD*** exceeds this default, the mainsail rated area shall be increased as defined in 109.2.

105.2 Foretriangle height IM shall be calculated as follows:

$$IM = \left(IG + \frac{IG \cdot (GO - MW)}{J - GO + MW}\right)$$

IM shall not be taken less than 0.65*(***P*** + ***BAS***).

105.3 If ***TPS*** is measured and the bowsprit is recorded as moveable sideways or spinnaker may be tacked off the centerline in accordance with IMS F7.3, this shall be considered by the VPP as a spinnaker pole with ***SPL*** = ***TPS***.

106 Mainsail

106.1 Mainsail measured area shall be calculated as follows:

$$Area = \frac{P}{8} \cdot (E + 2 \cdot MQW + 2 \cdot MHW + 1.5 \cdot MTW + MUW + 0.5 \cdot MHB)$$

If any of mainsail widths are not measured, they shall be taken as:

MHB = 0.05 * ***E***
MUW= 0.25 * ***E***
MTW= 0.41 * ***E***
MHW= 0.66 * ***E***
MQW= 0.85 * ***E***

Mainsail measured area is calculated by the trapezoidal method, dividing the luff in amounts of 1/4, 1/2, 3/4 and 7/8. Mainsail rated area is calculated by using the actual heights on the luff from the tack point to the points where mainsail girths are measured. These actual heights are calculated as follows:

$$MHWH = \frac{P}{2} + \frac{MHW - E/2}{P} \cdot E$$

$$MQWH = \frac{MHWH}{2} + \frac{MQW - (E + MHW)/2}{MHWH} \cdot (E - MHW)$$

$$MTWH = \frac{MHWH + P}{2} + \frac{MTW - MHW/2}{P - MHWH} \cdot MHW$$

$$MUWH = \frac{MTWH + P}{2} + \frac{MUW - MTW/2}{P - MTWH} \cdot MTW$$

Mainsail rated area is then calculated as follows:

$$Area = \frac{MQW + E}{2} \cdot MQWH + \frac{MQW + MHW}{2} \cdot (MHWH - MQWH) +$$
$$+ \frac{MHW + MTW}{2} \cdot (MTWH - MHWH) + \frac{MUW + MTW}{2} \cdot (MUWH - MTWH) +$$
$$+ \frac{MUW + MHB}{2} \cdot (P - MUWH)$$

Thereby, the amount of roach will proportionally increase the rated area from the measured one. Mainsail rated area shall be the largest rated area of any mainsail in the sail inventory.

106.2 If ***BD*** exceeds the limit determined in 108.3, the mainsail rated area shall be increased by $2*\boldsymbol{E}*(\boldsymbol{BD} - 0.06*\boldsymbol{E})$.

106.3 If the boat has a rotating mast, the mainsail rated area in increased for:

$$(\max(P + BAS, IM, ISP) - TL) \cdot MDL1 + \frac{MDL1+MDL2}{2} \cdot TL$$

107 Headsail

107.1 Headsail measured and rated area shall be calculated as follows:

$$Area = 0.1125 \cdot HLU \cdot (1.445 \cdot HLP + 2 \cdot HQW + 2 \cdot HHW + 1.5 \cdot HTW + HUW + 0.5 \cdot HHB)$$

107.2 Aerodynamic lift coefficients of the VPP calculation will be selected for different conditions as follows:

a) Headsail set on the forestay

b) Headsail **set flying**

c) For asymmetric spinnakers with ***SHW***/***SFL*** in range of 0.75 – 0.85 aerodynamic forces are calculated twice, with coefficients for the spinnaker and for the headsail set flying. The one giving the faster boat speed is used in the Time Allowance table.

d) Headsails set flying with ***HLP*** > 1.1·***J*** have their range of useable apparent wind angles restricted if they cannot be sheeted properly due to interference with the side stays (defined as “inside shrouds”).

e) If any of the headsails set flying in the sail inventory have battens, the lift coefficients are multiplied with an appropriate factor.

Additionally, the aerodynamic coefficients are downgraded in the upwind angles (AWA < 50):

f) If there is a headsail furler on a fixed forestay used in association with only one headsail in accordance with IMS F9.8

g) If all headsails and the mainsail are made of woven polyester

108 Symmetric Spinnaker

Symmetric spinnaker measured and rated areas shall be calculated as follows:

$$Area = \frac{SLU \cdot (SFL + 4 \cdot SHW)}{6}$$

109 Asymmetric Spinnaker

109.1 The asymmetric spinnaker luff shall be calculated as

$$ASL = \frac{SLU + SLE}{2}$$

109.2 Asymmetric spinnaker measured and rated areas shall be calculated as follows:

$$Area = \frac{ASL \cdot (SFL + 4 \cdot SHW)}{6}$$

110 Quadrilateral sails and sails set on the wishbone boom

Measured and rated areas of quadrilateral sails and sails set on the wishbone boom shall be calculated as:

$$Area = \frac{1}{4} \cdot \sqrt{4 \cdot P^2 \cdot QFL^2 - (P^2 + QFL^2 - QCD^2)^2} +$$

$$+ \frac{1}{4} \cdot \sqrt{QLM^2 \cdot QLE^2 - \left(QLM^2 + \frac{QLE^2}{4} - QCD^2\right)^2} +$$

$$+ \frac{1}{4} \cdot \sqrt{QLM^2 \cdot QLE^2 - \left(QLM^2 + \frac{QLE^2}{4} - QHL^2\right)^2}$$

P in this formula may be P or PY depending if the sail is set on the main or on the mizzen mast.

2. RULES APPLYING WHILE RACING

200 Crew Weight and Position

200.1 The weight of all crew members on board while racing weighed in light street clothes shall not be:

a) greater than the 130% of the crew weight as defined in 101.1
b) smaller than the 85% of the crew weight as defined in 101.1

200.2 Notice of Race and/or Sailing Instructions may modify 200.1.

201 Ballast, Fixtures and Equipment

201.1 The second sentence of the RRS 51 does not apply for the water ballast and/or canting keel systems.

201.2 Portable equipment, gear, sails and stores may only be moved from stowage for use in their primary purpose. Stowage in this respect is the position for any item of equipment or stores, to be maintained for the duration of a race or series, when such item is not in use for its primary purpose. Note: Moving sails or equipment with the intention of improving performance is prohibited and shall be considered as a breach of RRS 51, although this may be changed by the Notice of Race.

202 Manual Power

RRS 52 is modified. Non-manual power may be used for:

a) water ballast and any **hydrofoil**.

b) adjusting rigs and sails with any of items recorded as "NMP" as defined in IMS Rules F9 and G9.

c) use of an auto pilot when prescribed by the Notice of Race and/or Sailing Instructions.

d) remotely operated hydraulic valves, shift mechanisms, switches, and other devices with a similar purpose to facilitate the operation of otherwise manually powered systems.

203 Sails

203.1 *While racing* a boat shall carry onboard all the sails recorded in her certificate.

203.2 Operating devices for securing halyards under tension (e.g. halyard locks) shall be permitted only if they can be remotely operated from the deck.

203.3 Sails shall be set as defined in ERS B1 and rules 204 – 206 below.

204 Mainsail and Mizzen

When set on the mast the **head point** shall be the highest point of the **luff**. Mainsail and mizzen luff shall be reefed only from its bottom part or with a furling system in the mast.

205 Headsails

205.1 Headsails may be set on the forestay or **set flying**.

205.2 Headsails set flying shall be set using only the combination of hoists (***ISP***) and tack points (***TPS***) as recorded in the certificate.
When an HSF is set:

a) in front of the forestay it shall be tacked approximately on the boat's centerline,
b) between the forestay and the mast

i) it shall have $\boldsymbol{HLP} \leq 1.1 \cdot \boldsymbol{J}$
ii) it shall be tacked inside a spinnaker, whenever one is set

iii) it may be tacked away from the boat's centerline

205.3 Headsails shall be sheeted from only one point of the sail at a given time.

206 Spinnakers

206.1 Spinnakers shall be **set flying**. If there is a luff wire, it shall be completely attached to the **luff**, with no voids between the sail and the luff wire.

206.2 Leech lines shall not be adjustable while *racing* on symmetric spinnakers.

206.3 Spinnakers shall be set using only the combination of hoist (***ISP***) and tack points (***TPS*** *or* ***SPL***) as recorded in the certificate. When so recorded on the certificate (as per 104.3), spinnaker may be tacked anywhere within the sheer line, aft of ***TPS*** measurement.

206.4 Spinnakers shall be sheeted from only one point to any part of the boat or to the main boom.

207 Penalties

If any of the rules of ORC Part 2 are broken by the crew through no fault of their actions, the penalty imposed may be different from disqualification, including no penalty.

3. CERTIFICATES

301 Certificates

301.1 An **ORCmh International certificate** may be issued for a boat completely measured in accordance with the IMS and complying with the requirements of the IMS Rules and Regulations as well as ORC Rating systems.

301.2 An **ORCmh Club certificate** may be issued with less than complete IMS measurements, in these cases measurement data may be:

a) Measured in accordance with the IMS

b) Declared by the owner. Any declared data may be taken or corrected by the Rating Authority if there is reasonable doubt about any declared data.

c) Obtained from any other source, including photos, drawings, designs, data from identical or similar boats.

302 Certificate Issuing

303.1 Certificates shall be issued by the ORC Central Rating Office or by the National Rating Offices appointed by the ORC Nominating Bodies as approved by the ORC.

302.2 Offset file data will not be available to other parties without the written permission of the Designer.

303.3 The Rating Office shall have the authority to issue the certificate upon receipt of the measurement data, but if anything that can be considered unusual or against the general interest of the IMS Rule and Regulations or ORC Rating systems is found, the Rating Office may withhold the certificate pending an examination of the case and issue a certificate only after approval is obtained from the ORC. The rating office may, at its discretion, require a re-measurement of the boat before issuing a new certificate whenever there is reasonable doubt in any measurement data.

302.4 The certificate shall be valid until the date printed on the certificate, which shall normally be the 31st of December of the current year. All boats of the same event shall use certificates with the same VPP year version.

302.5 A boat shall have only one valid certificate at any one time. The valid certificate shall be only the latest one issued.

302.6 When the Rating Authority has reasonable evidence that not by her own fault a boat does not comply with her certificate, or that she should never have received a certificate, it shall withdraw the certificate, inform the owner or his representative in writing of the reasons for this withdrawal, re-check the data and

a) Re-issue a certificate if non-compliance may be corrected; or

b) If non-compliance may not be corrected the certificate shall be invalidated and the owner or his representative shall be informed in writing.

302.7 Once issued, valid ORC Certificates are uploaded to the ORC Database and are available at the ORC website in digital format.

303 Owner's Responsibility

303.1 The owner or his representative shall be responsible for:

a) Preparing the boat for measurement in accordance with the IMS

b) Declaring any required data to the measurer

c) Ensuring compliance of any measurement data with those printed on the certificate. Compliance with the certificate shall be defined as follows:

i) All measured, declared or recorded values shall be as close as possible to those on the certificate. Differences are allowed only if the values on the certificate give a worse rating (i.e., lower MHR)

ii) The sail inventory shall include all sails that are record on the certificate.

iii) The owner's declaration of crew weight shall not be considered as an issue of compliance with the certificate, but it is applied while racing in accordance with Rule 200.

d) Using the boat and equipment as prescribed by the RRS, IMS Rule and ORC Multihull Rating Systems.

303.2 A certificate shall be automatically invalidated by a change of ownership. The new owner may request a new certificate with a simple declaration that no changes have been made so a new certificate may be issued without the need of any new measurement. Conversely the new owner has every right to have his boat re-measured. However, if the flotation date is older than 10 years at the time of the ownership change, new flotation measurements shall be performed.

303.3 Any change of the measurement data requires new measurement and issuing a new certificate. Such a change may be:

a) Changes of ballast in amount or location or configuration.

b) Change of tankage, fixed or portable, in size or location.

c) Any changes in the engine and/or propeller installation.

d) Addition, removal or change of location of gear or equipment, or structural alteration to the hull that affect the trim or flotation of the yacht.

e) Movement of any measurement bands used in sail area measurement, or any changes in spars, spar location or headstay position.

f) Any change to the size, cut or shape of any sail.

g) Changes to the shape of the yacht's hull and/or appendages

h) Changes to spars or standing rigging configuration, including elements of rigging identified as adjustable while *racing*.

j) Any other change of the data in the certificate that affect the rating.

304 Measurement Protests

304.1 When, as a result of any pre-race inspection or measurement, it is determined that a boat does not comply with her certificate, the following rules apply:

a) When the non-compliance is considered to be minor and can be easily corrected, the boat may be brought into compliance with her certificate, and, when necessary, a new certificate may be issued. The Measurer shall inform the Technical Committee of such a correction, who shall approve a new certificate issue.

b) When the non-compliance is major (even if it can be corrected) or if it cannot be corrected without requiring significant re-measurement, a boat shall not be eligible to enter a regatta. The Measurer shall inform the Technical Committee who shall act in accordance with the RRS and inform the Rating Authority.

304.2 When, as a result of any measurement protest by a boat or by the Technical Committee, it is determined that a boat does not comply with her certificate in accordance with 303.1(c)(i) and (ii), the non-compliance shall be calculated as a difference in percentage of MHR:

a) If the difference is less than or equal to 0.1%, the original certificate will be maintained, the protest will be dismissed, and the protestor will have to cover any cost involved. RRS 64.4(a) will apply but no corrections are needed.

b) If the difference is more than 0.1% but less than or equal to 0.25%, no penalty shall apply, but a new certificate shall be issued based on the new measurement data and all races of the series shall be rescored using the new certificate data. The Protest will be considered accepted and the protestee will have to cover any cost involved.

c) If the difference is more than 0.25% but less than 0.40%, a boat shall receive a scoring penalty that shall be 50% of the score for Did not Finish, rounded to the nearest whole number (0.5 rounded upward) in any race in which her rating was incorrect. A new certificate shall be issued based on the new measurement data and all races of the series shall be rescored using the new certificate data. The Protest will be considered accepted and the protestee will have to cover any cost involved.

d) If the difference is 0.40% or more, a boat shall be disqualified (DSQ) in any race in which her rating was incorrect. The Protest will be considered accepted and the protestee will have to cover any cost involved and the yacht shall not race again until all non-compliance issues are corrected to the limit defined in a) above.

304.3 If a boat's certificate has to be recalculated during a race or series as a result of an error or an omission in the production of the certificate of which the boat owner could not have been reasonably aware, according to 302.6(a), all races of the series shall be rescored using the new data.

304.4 The results of a race or series shall not be affected by measurement protests lodged after the prize giving or such other time as the Sailing Instructions may prescribe. Nothing in this paragraph shall bar action under the RRS concerning a boat deliberately altered and shall not limit in any way acts of the Race and Protest Committees against any individual person involved.

4. SCORING

401 General

401.1 The ORC Multihull Rating system provides a variety of methods for calculating corrected times using the polar speed table calculated by the ORCmh VPP and displayed on the ORCmh certificates. Selection of the scoring method depends on the size, type and level of the fleet, type of the race, and local racing conditions and its use is at the discretion of National Authorities or local event organizers, except for the events governed by the ORC Championship Rules. Scoring method, type of course and custom course model, when used, shall be defined in the Notice of Race and/or Sailing Instructions.

401.2 Corrected times shall be displayed in the dd:hh:mm:ss format. When calculating corrected time, the boat's elapsed time shall be translated to seconds, calculations shall be made and results shall be then rounded to the nearest second (for example: 12345.5 = 12346 seconds). This time in seconds shall be then restored to the dd:hh:mm:ss format.

401.3 When the length of the course is needed for calculation of corrected time, it shall be recorded to a precision of 0.01 NM.

401.4 Multihull Rating (MHR) is an average representation of all time allowances in all wind speeds and wind directions. It is also used as single number Time on Distance Rating as defined in 403.2. It may be used for simple comparisons between boats and possible class divisions.

402 Polar Curve Scoring

402.1 Polar Curve Scoring uses the full capacity the ORC rating systems. Its unique feature is its capacity to offer different Time Allowances for different wind conditions and types of course. Yachts have different performance profiles, some are fast in light airs, others are fast in strong winds, some are fast reaching, some are fast upwind. because yachts do not have the same performance in different wind strengths and directions. A single number rating averages these differences out, Polar Curve Scoring provides ratings for the fleet that are sensitive to the wind strength and point of sail on each leg of the course.

402.2 The ORCmh certificate provides a range of time allowances expressed in s/Nm for different wind strengths in the range of 4 – 24 knots, and different points of sail from optimum upwind (beat),through 52, 60, 75, 90, 110, 120, 135, 150 degrees of true wind angle to the optimum downwind (run).

Time Allowances in secs/NM							
Wind Velocity	**6 kt**	**8 kt**	**10 kt**	**12 kt**	**14 kt**	**16 kt**	**20 kt**
Beat VMG	902.2	699.0	597.8	535.0	489.7	454.1	420.6
52°	567.1	453.1	393.9	353.1	321.3	295.2	271.8
60°	522.3	426.3	372.0	332.4	300.6	274.0	249.9
75°	488.7	404.8	322.7	281.6	247.1	223.5	218.3
90°	444.8	371.4	321.3	280.5	245.2	214.7	187.2
110°	487.2	401.0	339.6	292.7	254.0	222.2	195.1
120°	513.3	408.9	346.2	298.9	259.6	226.6	180.5
135°	584.4	444.7	376.9	327.5	287.0	252.0	195.8
150°	704.8	532.1	437.1	380.5	336.8	299.7	236.7
Run VMG	813.9	614.4	504.8	439.4	388.9	346.0	273.3
Selected Courses							
Windward / Leeward	858.0	656.7	551.3	487.2	439.3	400.1	346.9
All purpose	638.9	500.1	423.8	373.4	333.9	299.5	262.1

Figure 1 - Time allowances as printed on the ORCmh Certificate

402.3 When calculating corrected time by the Polar Curve Scoring, a course to be sailed may be taken as one of the pre-selected courses for which time allowances are given on the certificate or constructed from the mark positions.

402.4 Pre-selected courses are:

a) **Windward/Leeward** is a conventional course where the race course consists of 50% upwind and 50% downwind legs.
b) **All-purpose** course type includes equal distribution of all wind directions, as might be experienced racing around an island.

402.5 When the course is constructed the following data shall be taken for each leg:

- wind direction,
- length and heading of each leg,
- and optionally, the direction and rate of the current on each leg.

Any leg can be split in sub-legs in case there is a marked shift in wind and/or current direction.

402.6 The percentage of each true wind angle , is calculated from the mark positions.

402.7 For each course, a boat's performance curve is calculated using the course definition and time allowances given in the certificate.

402.8 The vertical axis represents the speed achieved in the race, expressed in seconds per mile. The horizontal axis represents the wind speed in knots *(Figure 2)*. Elapsed time shall be divided by the distance of the course to determine the average speed in seconds per mile. For that average speed a point on the performance curve shall be determined by interpolation and a respective average wind for that point shall be determined as "Scoring Wind". If the "Scoring Wind" point would fall outside of 4 - 24 knots of wind a respective 4 or 24 knots value shall be used.

"Scoring Wind" is representing the boat's performance on that course. The faster the boat has sailed, the higher the "Scoring Wind", which is the primary index for scoring.

402.9 The highest "Scoring Wind" from the fleet is then used as the wind speed for corrected time calculations. For that wind on the horizontal axis, the appropriate time allowances are determined on each boat's curve on the vertical axis. Such a time allowance is then used as a single number Time-on-Distance coefficient as defined in 403.2.

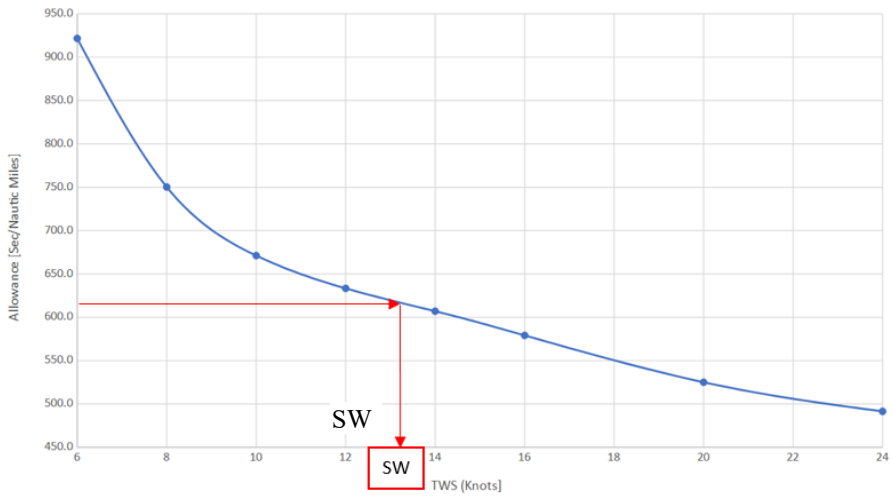

Figure 2: Typical Polar Performance Curve derived for a specified course and wind direction

402.10 An alternative to the method described in 409.9 is that results can be determined by the order from the highest to the lowest "Scoring wind". In such a case corrected times are calculated from the performance curve of each boat by converting her "Scoring wind" to a time allowance that is multiplied by the length of the course. Use of this method shall be specified in the Notice of Race and Sailing Instructions.

402.11 Race results can be re-scored after the race only if the winning boat is found not complying with her certificate according to Rules 303.6, 305.2(b) or (c). In that case, the "Scoring wind" of the best boat after re-calculation shall be used as the wind speed for corrected times calculations.

402.12 "Scoring Wind" for the winning boat normally approximates the predominant wind strength for the race. However, in cases where the "Scoring Wind" does not represent fairly the real wind strength during a race, the wind strength may be determined by the Race Committee.

402.13 All the formulas for course and performance curve construction and interpolations together with relevant code for the scoring software are available from ORC and scoring software may be downloaded at the ORC website (www.orc.org).

403 Single Number Scoring Options

403.1 ORC certificates are also offering single number scoring options as Time on Time and Time on Distance ratings calculated for Windward/Leeward and All-purpose courses.

Single Number Scoring Options		
Course	Time On Distance	Time On Time
Windward / Leeward	510.2	1.1760
All purpose	388.6	1.5440

Figure 3 – Single number scoring options as printed on the ORCmh Certificate

403.2 Time-On-Distance

With Time-on-Distance (ToD) scoring, the time allowance of one boat will not change with wind speed but will change with the length of the course. One boat will always be giving to another the same time allowance in s/Nm, and it is easy to calculate the difference in elapsed time between two boats needed to determine a winner in corrected time.

Corrected time is calculated as follows:

$$Corrected\ time = Elapsed\ time - (ToD_{Delta} * Distance)$$

Where $ToD_{Delta} = ToD_{\text{the boat}} - ToD_{\text{the lowest (fastest boat) in the fleet}}$

where the corrected time of the boat having the fastest ToD in the fleet will be equal to her elapsed time.

ToD coefficients are calculated for the respective course model (Windward/Leeward or All-purpose) with the following wind strength distribution:

TWS (kt)	***6***	***8***	***10***	***12***	***14***	***16***	***20***
Time Allowance percentage	5%	10%	20%	30%	20%	10%	5%

A custom-made ToD coefficient may be calculated using a different course model and different wind distribution matrix based on wind historical data or weather forecast for a particular race. The course model to be used shall be specified in the Notice of Race and/or Sailing Instructions.

403.3 Time-On-Time

With Time-On-Time (ToT) scoring, time allowances will increase progressively through the duration of the race. Course distance has no effect on the results and need not be measured. Corrected time will depend only on the elapsed time, and the difference between boats may be seen in seconds depending on the duration of the race. The longer the race, the larger the time allowance.

Corrected time is calculated as follows:

$$Corrected\ time = ToT * Elapsed\ time$$

ToT coefficients are calculated for the respective course model (Windward/Leeward or All-purpose) as follows:

$$ToT = \frac{600}{ToD}$$

A custom-made ToT coefficient may be calculated using a conversion factor to the custom-made ToD coefficient calculated as in 403.2. A conversion factor different from 600 may be set as ToD representing the middle of the fleet. Use of a different correction factor will not change the place in corrected times, it will only affect the differences in corrected time.

ORCmh INTERNATIONAL CERTIFICATE SAMPLE

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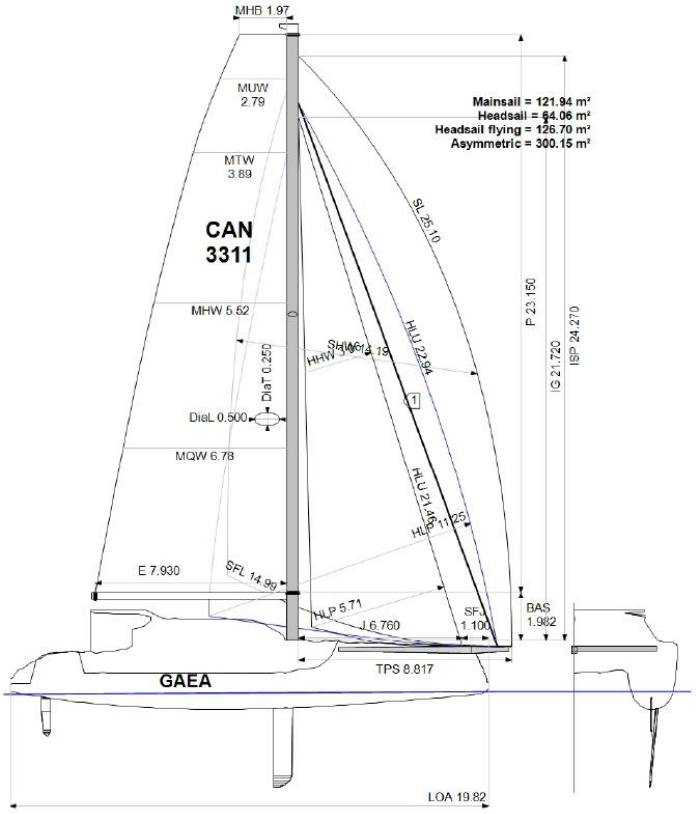

Rated boat velocities in knots									
Wind Velocity	4 kt	6 kt	8 kt	10 kt	12 kt	14 kt	16 kt	20 kt	24 kt
Beat Angles	45.7°	45.7°	45.0°	44.7°	43.0°	41.7°	41.1°	40.3°	41.8°
Beat VMG	2.41	3.54	4.61	5.62	6.49	7.19	7.81	8.88	8.91
52°	3.79	5.54	7.20	8.72	9.85	10.80	11.73	13.58	13.82
60°	4.10	5.99	7.77	9.30	10.40	11.43	12.54	15.07	15.52
75°	5.06	7.53	9.47	9.81	10.96	12.19	13.70	18.06	19.08
90°	5.32	7.59	9.69	11.28	11.02	12.32	14.07	19.13	22.65
110°	5.00	7.33	9.42	11.00	12.70	14.50	17.03	20.97	20.86
120°	4.66	6.88	8.92	10.48	12.04	13.98	16.35	21.85	18.03
135°	4.01	5.97	7.87	9.53	10.88	12.31	14.06	18.51	23.48
150°	3.38	4.99	6.56	8.09	9.38	10.53	11.75	15.19	19.21
Run VMG	2.93	4.32	5.68	7.01	8.13	9.12	10.18	13.15	16.64
Gybe Angles	141.5°	141.5°	141.2°	143.8°	147.1°	148.0°	143.9°	137.8°	137.2°

MHR: **403.1** CertNo: **MH033**

BOAT

Class	**CJ65**
Designer	**Morelli & Melvin**
Builder	**Westerly Marine**
Age date	**09/2011**
Series date	**08/2011**
Offset file	**Gaea.off**
Data file	**MH033-M&M65-Gaea**

HULL

Length Overall	**19.817**
Maximum Beam	**8.702**
Draft	**3.887**
Displacement	**18,584**
DLR	**2.5162**
Dynamic Allowance	**0.020%**
Age Allowance	**0.487%**
RSA	**-0.152%**

PROPELLER

Installation	**Shaft non exposed**
Type	**Folding 3 blades**
Diameter	**0.508m**

CREW

Weight	**680** (declared)
Crew Arm Extension	

SAIL AREAS (m²)

	Measured
Mainsail	**121.94**
Headsail Luffed	**64.06**
Headsail Flying	**126.70**
Symmetric	
Asymmetric	**300.15**

COMMENTS

ex Mauliola

The owner and any other person in charge is responsible that boat is complying with her certificate in accordance with RRS 78.1 and ORC Rule 304.

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Time Allowances in secs/NM									
Wind Velocity	4 kt	6 kt	8 kt	10 kt	12 kt	14 kt	16 kt	20 kt	24 kt
Beat VMG	1495.7	1018.2	780.2	640.1	555.0	500.4	461.2	405.3	404.2
52°	949.1	649.8	500.1	412.9	365.6	333.3	306.9	265.0	260.5
60°	878.6	601.1	463.6	387.0	346.2	315.0	287.0	238.9	231.9
75°	710.9	478.1	380.0	366.8	328.5	295.4	262.8	199.3	188.6
90°	676.8	474.2	371.6	319.1	326.7	292.1	255.9	188.2	158.9
110°	719.7	491.1	382.2	327.4	283.4	248.4	211.4	171.7	172.6
120°	772.2	523.0	403.4	343.4	299.1	257.6	220.2	164.8	199.7
135°	897.2	602.6	457.3	377.8	330.9	292.5	256.1	194.5	153.3
150°	1065.3	721.4	548.6	444.8	383.6	341.9	306.3	237.0	187.4
Run VMG	1230.1	833.0	633.4	513.6	443.0	394.8	353.7	273.7	216.4
Selected Courses									
Windward / Leeward	1362.9	925.6	706.8	576.9	499.0	447.6	407.4	339.5	310.3
All purpose	1003.1	681.8	524.1	438.3	386.7	346.0	310.8	252.9	236.4

Single Number Scoring Options		
Course	Time On Distance	Time On Time
Windward / Leeward	529.3	1.1336
All purpose	403.1	1.4884

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Data in **meters/kilograms (Metric)**

HULL AND APPENDAGES (Lightship Trim)

Class	**CJ65**	LOA	**19.817**	Superstructure frontal area	**20.89**
Measurement		Max. Beam	**8.702**	Superstructure lateral area	**43.80**
HIN		Draft	**3.887**	Default crew weight	**689**
		Displacement	**18,584**	Declared crew weight	**680**
		Dspl lightship	**17,685**		
		Wetted area	**63.17**		

PROPELLER

Propeller Type	**Folding 3 blades**						
Installation	**Shaft non exposed**	PRD	**0.508**	PSD	**0.032**	PSA	**14.3°**
Twin screw	**Yes**	PBW		PHD	**0.090**	ESL	**0.188**
Hydro generator	**No**	PIPA	**0.0046**	PHL	**0.156**		

RIG

Single headsail furler	**Yes**	P	**23.150**	E	**7.930**
Mainsail furler	**No**	IG	**21.720**	J	**6.760**
Articulated bowsprit	**No**	ISP	**24.270**	JZ	**2.054**
Non-circular rigging	**No**	MDT1	**0.250**	BAS	**1.982**
Adjustable mast foot	**No**	MDL1	**0.500**	FSD	
Running backstays	**0**	MDT2	**0.250**	SFJ	**1.100**
Checkstays	**0**	MDL2	**0.500**	SPL	
Spreaders	**1**	TL		WPL	
Jumper Struts	**No**	MW	**0.500**	TPS	**8.817**
Rotating mast	**No**	GO	**0.500**	BD	
Mast rake					
Mast cant angle	**0°**				

Foretriangles

Id	*I*	*TP*	*TPZ*	*Comment*
0	**21.720**	**6.760**	**2.054**	**main forestay**
0	**24.270**	**8.817**	**2.054**	**ISP/TPS**
1	**22.286**	**8.230**	**2.050**	

FLOTATION

Flotation Date **22/07/2025**

TANKS

Id	*Description*	*Capacity*	*LCG*	*VCG*	*Sp.Wght*	*Condition Measurement*	*Level Sailing*
9	Black Port	170	5.50	-0.40	1.0000	0	
8	Black Stbd	170	5.50	-0.40	1.0000	78	
7	Fresh Port fwd	208			1.0000	0	
6	Fresh Port aft	170	12.50	-0.50	1.0000	170	
5	Fresh Stbd	425	12.50	-0.50	1.0000	390	0.200
4	Fuel stbd aft	240	9.70	-0.50	0.8400	0	0.100
3	Fuel Stbd aft	240			0.8400	0	0.100
2	Fuel Port fwd	340			0.8400	0	0.120
1	Fuel Stb fwd	340			0.8400	0	0.120

INVENTORY

Id	*Description*	*Weight Msrment*	*Weight Sailing*	*LCG*	*VCG*	*GA*
#	11 Fenders	22	22			
#	Chart Table	20	20			X
#	Pots and Pans	25	0			
#	Food	25	0			
#	Clothes Stbd	15	0			
#	Inner					
1	Mainsail					

Id	*Description*	*Weight Msrment*	*Weight Sailing*	*LCG*	*VCG*	*GA*
#	Tools	30	10			
#	Speakers	15	15			
#	Fridge	35	0			
#	Clothes Port	20	0			
#	J4					
#	GS					

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MAINSAIL

Id	*MHB*	*MUW*	*MTW*	*MHW*	*MQW*	*Area*	*Meas.Date*	*Comment*
Main	1.97	2.79	3.89	5.52	6.78	121.94	08/08/2022	OUS 142710-001 117kg

HEADSAIL

Id	*HHB*	*HUW*	*HTW*	*HHW*	*HQW*	*HLP*	*HLU*	*Btn*	*Flying*	*FT*	*Area*	*Meas.Date*	*Comment*
Yankee	0.07	1.35	2.72	5.47	8.22	11.25	22.94	No	Yes	1	126.70	08/08/2022	OUS 142710-005
Solent	0.07	0.79	1.56	3.06	4.50	5.71	21.46	No	No	0	64.06	08/08/2022	OUS 142710-002
Inner Jib	0.09	0.62	1.21	2.39	3.66	5.07	14.04	No	Inner	0	34.60	08/08/2022	OUS 142710-003

ASYMMETRIC SPINNAKER

Id	*SLU*	*SLE*	*SL*	*SHW*	*SFL*	*Ratio*	FT	*Area*	*Meas.Date*	*Comment*
A3	26.35	23.85	25.10	14.19	14.99	95%	0	300.15	11/04/2025	ONZ1221-001
G1	25.14	22.42	23.78	11.18	14.73	76%	0	235.62	08/08/2022	OUS 142710-006

ORCmh CLUB CERTIFICATE SAMPLE

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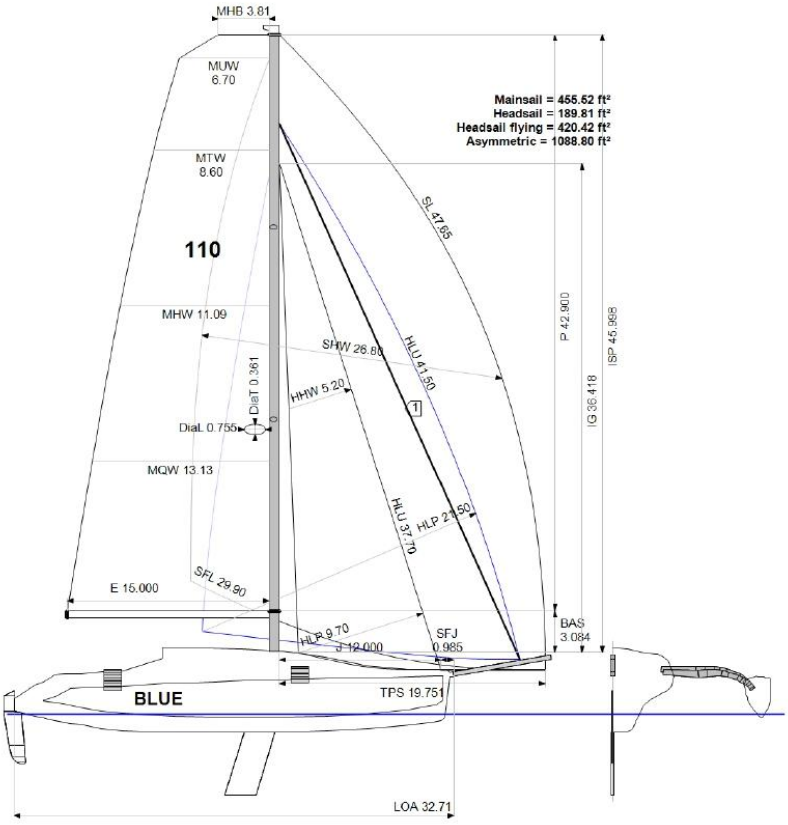

MHR: **442.0** CertNo: **MC105**

BOAT

Class	**F32RX**
Designer	**Farrier**
Builder	**Melvest Marine**
Age date	**10/2010**
Series date	**01/2004**
Offset file	**F32X.off**
Data file	**MC105-F32RX-Blue**

HULL

Length Overall	**32.710**
Maximum Beam	**23.668**
Draft	**5.774**
Displacement	**4,651**
DLR	**2.2397**
Dynamic Allowance	**0.240%**
Age Allowance	**0.487%**
RSA	**0.000%**

PROPELLER

Installation	**No Propeller**
Type	**N/A**
Diameter	**N/A**

CREW

Weight	**600** (declared)
Crew Arm Extension	

SAIL AREAS (ft²)

	Measured
Mainsail	**455.52**
Headsail Luffed	**189.81**
Headsail Flying	**420.42**
Symmetric	
Asymmetric	**1088.80**

COMMENTS

ex Blue Steel

The owner and any other person in charge is responsible that boat is complying with her certificate in accordance with RRS 78.1 and ORC Rule 304.

Rated boat velocities in knots

Wind Velocity	4 kt	6 kt	8 kt	10 kt	12 kt	14 kt	16 kt	20 kt	24 kt
Beat Angles	45.3°	45.3°	42.5°	41.6°	40.5°	41.9°	40.6°	41.2°	42.2°
Beat VMG	2.92	4.06	4.84	4.94	5.24	5.46	5.64	5.56	5.38
52°	4.70	6.34	7.34	7.43	7.88	8.38	8.69	8.61	8.31
60°	5.06	6.79	7.82	7.94	8.52	9.32	9.85	9.90	9.64
75°	5.48	7.21	8.54	9.89	9.93	11.62	12.81	13.69	13.95
90°	5.45	7.26	8.88	11.00	11.43	13.80	16.11	18.12	19.40
110°	4.67	6.61	8.33	10.11	12.40	14.29	14.78	18.54	21.31
120°	4.76	6.56	8.13	10.03	12.04	14.48	16.28	16.59	20.02
135°	4.16	5.92	7.44	8.87	10.89	13.04	15.05	19.24	21.74
150°	3.40	4.96	6.38	7.52	8.94	10.81	12.68	16.26	19.59
Run VMG	2.94	4.30	5.52	6.51	7.74	9.36	10.98	14.08	16.97
Gybe Angles	142.4°	142.4°	145.1°	146.6°	137.6°	139.0°	141.1°	144.5°	147.6°

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Time Allowances in secs/NM									
Wind Velocity	4 kt	6 kt	8 kt	10 kt	12 kt	14 kt	16 kt	20 kt	24 kt
Beat VMG	1234.8	886.8	743.6	728.1	686.9	659.6	638.0	647.2	669.2
52°	766.2	568.1	490.7	484.4	457.1	429.8	414.4	418.0	433.1
60°	712.1	530.5	460.2	453.2	422.3	386.4	365.6	363.8	373.5
75°	656.8	499.4	421.7	363.9	362.5	309.7	280.9	263.0	258.1
90°	660.6	495.7	405.3	327.4	314.9	260.9	223.5	198.7	185.6
110°	771.7	544.5	432.0	356.1	290.4	251.9	243.6	194.2	168.9
120°	755.5	548.8	442.6	359.0	298.9	248.7	221.1	217.1	179.8
135°	865.4	608.4	483.9	405.8	330.6	276.2	239.3	187.1	165.6
150°	1060.2	725.3	564.4	478.9	402.9	332.9	283.8	221.4	183.7
Run VMG	1224.3	837.5	651.7	552.9	465.2	384.4	327.8	255.6	212.2
Selected Courses									
Windward / Leeward	1230.1	862.1	697.6	640.5	576.0	522.0	482.9	451.4	440.7
All purpose	916.4	655.5	535.2	479.6	433.7	386.8	356.9	331.8	321.8

Single Number Scoring Options		
Course	Time On Distance	Time On Time
Windward / Leeward	589.1	1.0186
All purpose	442.0	1.3575

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Data in **feet/pounds (Imperial)**

HULL AND APPENDAGES (Lightship Trim)

Class	**F32RX**	LOA	**32.710**	Superstructure frontal area	**15.29**
Measurement		Max. Beam	**23.668**	Superstructure lateral area	**127.77**
HIN	**MEL-32RX005**	Draft	**5.774**	Default crew weight	**714**
		Displacement	**4,651**	Declared crew weight	**600**
		Dspl lightship	**4,051**		
		Wetted area	**122.49**		

PROPELLER

Propeller Type	**No Propeller**
Hydro generator	**No**

RIG

Single headsail furler	**No**	P	**42.900**	E	**15.000**
Mainsail furler	**No**	IG	**36.418**	J	**12.000**
Articulated bowsprit	**No**	ISP	**45.998**	JZ	**3.327**
Non-circular rigging	**No**	MDT1	**0.361**	BAS	**3.084**
Adjustable mast foot	**No**	MDL1	**0.755**	FSD	
Running backstays	**0**	MDT2	**0.361**	SFJ	**0.985**
Checkstays	**0**	MDL2	**0.755**	SPL	
Spreaders	**2**	TL		WPL	
Jumper Struts	**No**	MW	**0.755**	TPS	**19.751**
Rotating mast	**Yes**	GO	**0.755**	BD	
Mast rake					
Mast cant angle					

Foretriangles

Id	*I*	*TP*	*TPZ*	*Comment*
0	**36.418**	**12.000**	**3.327**	**main forestay**
0	**45.998**	**19.751**	**3.327**	**ISP/TPS**
1	**39.371**	**17.848**	**4.102**	

FLOTATION

Flotation Date	**28/08/2024**

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MAINSAIL

Id	*MHB*	*MUW*	*MTW*	*MHW*	*MQW*	*Area*	*Meas.Date*	*Comment*
Main	3.81	6.70	8.60	11.09	13.13	455.52	28/08/2024	

HEADSAIL

Id	*HHB*	*HUW*	*HTW*	*HHW*	*HQW*	*HLP*	*HLU*	*Btn*	*Flying*	*FT*	*Area*	*Meas.Date*	*Comment*
Screach	0.17	2.30	4.70	9.42	15.36	21.50	41.50	No	Inside shrouc	1	420.42	28/08/2024	
Jib	0.00	1.32	2.63	5.20	7.49	9.70	37.70	No	No	0	189.81	28/08/2024	Widths estimated from HHW 1.6

ASYMMETRIC SPINNAKER

Id	*SLU*	*SLE*	*SL*	*SHW*	*SFL*	*Ratio*	FT	*Area*	*Meas.Date*	*Comment*
A Spin	51.00	44.30	47.65	26.80	29.90	90%	1	1088.80	28/08/2024	