

MULTI2000 RATING RULE R2026

INDEX

- 1 Introduction
- 2 General Rules
- 3 Safety
- 4 General information
- 5 Rating certificates
- 6 Measurements and compliance
- 7 Reassessment of the assigned rating
- 8 Basic rating formula **R** (Time Correction Coefficient)
- 9 Rated length **RL**
- 10 Rigging and sails, rated sail area **RS**
- 11 Lightweight **W**, rated weight **RW**
- 12 Power coefficient **CP**
- 13 Appendices **Q** factor
- 14 Engine and propeller **PF** factor
- 15 Habitability **HF** factor
- 16 Carbon Mast **MCA**
- 17 Tilttable mast **MK**
- 18 Age allowance **AA**
- 19 Seaworthiness and safety
- 20 List of annexes

1. INTRODUCTION

The objective of the Multi2000 Rule is to provide a simple and fair rating system using time correction factors for a wide range of multihull types.

Multihulls capable to full flying mode on hydrofoils are also covered by this system but the current single number time correction coefficient cannot capture the very wide variability of behavior of hydrofoils compared to buoyancy-based hulls.

2. GENERAL RULES

- 2.1. The formulas and method of calculating the rule are public.
- 2.2. Rating calculations are based on data declared by the owner or his representative.
- 2.3. Some or all of the characteristics of production multihulls may be standardized by the AMH.
- 2.4. The AMH recommends using an approved measurer to certify the declared characteristics.
- 2.5. The Multi2000 Rule provides ratings for a wide range of multihulls and encourages the exploitation of the potential of the boats.
- 2.6. Multihull ratings are calculated in good faith from data declared by the owner or his representative. The AMH cannot accept any responsibility in the event of an error or modification of the measurement rules that the owner/competitor considers having disadvantaged or harmed his boat, or conversely to have favored any boat of another owner/competitor.
- 2.7. The Multi2000 rating system applies RRS 52 rule: a boat's standing rigging, running rigging spars and movable full appendages must be adjusted and operated using only the physical power provided by the crew. With the exception of electrical winches or winch handles used to hoist the mainsail .

3. SAFETY

- 3.1. The safety of a multihull and all its management, including insurance, is the responsibility of the owner/competitor who must ensure that the multihull is well suited to the sailing conditions and crewed by a sufficient number and experience, physically fit to face bad weather. The owner/competitor must be confident in the strength of the hulls, spars, rigging, sails and all equipment. He must ensure that all safety equipment is properly maintained, stowed with valid dates, and that the crew knows where it is kept and how it is to be used. The final decision on whether or not to race remains the sole and unavoidable responsibility of the owner or his representative.
- 3.2. Neither the establishment of these rules, nor their use by the race organizers, nor the inspection of the multihull under these rules in any way limits or replaces the absolute liability of the owner/competitor.

4. GENERAL INFORMATION

- 4.1. The Multi2000 rating is a system designed to generate rankings of multihulls in compensated time.
- 4.2. The Multi2000 rating is managed exclusively by the AMH.
- 4.3. The Multi2000 rating is the only system recognized by the French Sailing Federation (FFV) for habitable multihull regattas in compensated time on mainland France.
- 4.4. Any significant change to the AMH statutes or the measurement rules must be submitted to the FFV for approval.
- 4.5. Requests for interpretation of the measurement rules must be made through the AMH Technical Advisor. The numbered interpretations will be published on the AMH website and possibly incorporated into the annual revisions of the measurement.
- 4.6. The Multi 2000 Rating is calculated as a time correction **coefficient (TCC)** to three decimal places. The compensated (corrected) times must be calculated from this rating with an accuracy of the nearest second.
- 4.7. The AMH **or representative association** may withdraw or suspend the certificate of a multihull without compensation in the event of a serious breach of the Regulations or of good morals or sportsmanship.
- 4.8. The display on the multihull of the advertising chosen by the owner is authorized subject to compliance with the rules of the events in which it participates.

5. MULTI 2000 CERTIFICATES

- 5.1. Multi2000 certificates are issued by the AMH at the beginning of the calendar year and remain valid until the end of the year unless modified. If the modification, requested by the owner of the boat, is the result of changes having an impact on the value of the rating, such as for example the sail plan, a new certificate will be issued. It is strongly recommended that Owners anticipate the request for the new certificate as much as possible. Certificates are issued on condition that the owners are up to date with their contributions.
- 5.2. A multihull must not have more than one valid certificate. The issuance of a new certificate automatically invalidates the old one. It is recommended to keep on board a copy of the certificate.
- 5.3. Multi2000 Certificates are issued in the form set out in **Annex 3**. They will state the origin of the data and to be valid they must be stamped by the AMH **or representative**. The AMH **or representative** will inform the owner of the multihull of any measurements or

other checks required to issue a valid certificate.

- 5.4. Change of ownership and/or any change in sail dimensions or nominal dimensions of the multihull, automatically invalidates the certificate.
- 5.5. Where the AMH has reasonable evidence that a multihull does not comply with its certificate, or that there has been a breach of the rules, the certificate may be withdrawn, and the owner must be informed in writing. Where a certificate is invalid, the AMH reserves the right to inform the Race Management in which the multihull is participating.
- 5.6. The validity of a certificate is conditional upon payment of the requested fees, including the annual subscription to the AMH **or representative association**.

6. MEASUREMENTS AND COMPLIANCE

- 6.1. The measurements follow the latest release of "Equipment Rules of Sailing" (ERS) defined by the World Sailing (formerly ISAF) unless otherwise specified in the following rules or in Annex 1 "Calculation formulas".
- 6.2. Measurements must be recorded in the International System of Units (SI units). Measurements are expressed in meters to two decimal places, except for measurements of the mast cross-section which must be to three decimal places. Weight must be taken to the nearest kilogram.
- 6.3. Measurement data may be obtained by direct measurement or derived from another certificate.
- 6.4. Sails must be measured in accordance with the instructions in the spreadsheet in Appendix 1
- 6.5. The accuracy of the measurements provided is the responsibility of the owner. Advice may be sought from the AMH or representative.
- 6.6. Any owner or individual providing false information will be considered a breach of the Multi2000 measurement rule and will invalidate the certificate.
- 6.7. The AMH **or representative association** reserves the right to carry out, with the agreement of the Owner, random checks to verify the conformity of the multihull with the data given on the certificate. Refusal to carry out checks may result in invalidation of the certificate.
- 6.8. The AMH will use the declared data as the basis for calculating the rating but reserves the right to correct specific data or to standardize the dimensions of a class of production multihull.

7. REASSESSMENT OF THE ASSIGNED RATING

- 7.1. An owner can request a review of the rating of his own multihull by submitting a request to the AMH Technical Advisor and paying the fee for issuing a new certificate if revised. The reassessment will be based on all available evidence. If necessary, the data will be reassessed by the AMH Technical Advisor. The decision of the AMH will be final.
- 7.2. For series-produced multihulls, the characteristics may have been standardized by the AMH. Standard data shall not be subject to review unless requested by the manufacturer or class association of a series-produced multihull. If applicable, changes to the standard data shall be declared by the owner.

8. BASIC RATING FORMULA **R** (Time Correction Coefficient)

$$R = C \text{ (constant)} * (RL^{0.3} * (CP*RS)^{0.4} / RW^{0.325}) * Q * PF * HF * MCA * MK * AA$$

See Annex 1 **for further details.**

9. RATED LENGTH **RL** (dynamic waterline)

- 9.1. The rated length shall be considered as the distance between the vertical planes of the fore and aft measurement of the complete platform, at mid-freeboard. All slenderness between the waterline and mid-freeboard shall be included, in particular the inverted bows, as shown in the diagrams in Annex 1.
- 9.2. This length RL shall be measured under the same weight conditions as for weighing (see 11.1). Therefore, it is strongly recommended to have this length checked by an approved measurer, at the time of weighing.

10. RIGGING AND SAILS, RATED SAIL AREA **RS**

- 10.1. The procedure for calculating the area is given in Annex 1
- 10.2. It is strongly recommended to have these measurements carried out by an approved measurer or issued by the sailmaker.
- 10.3. If only the surfaces are indicated, a penalty of 10% will be applied to the total surface measured.

10.4. A rotating mast leads to a contribution to the surface of the mainsail calculated from the length of the luff and the longitudinal sections MSL and maximum transverse sections MST of this mast. (see Annex 1)

10.5. Any headsail set flying (flying jib, gennaker, code 0, etc.) whose width at mid-height (SMG, DMG) is less than 75% of its foot (SF, DF) shall be considered as a drifter.

For the measurement of the drifter:

- If DMG is greater than or equal to 60% of DF, its height DH, DF and DMG will be measured in the area calculation formula (See Annex 1).

- If DMG is less than 60% of DF, the sail shall be measured as a jib using DL and DP, DC and DR to calculate its area (See Annex 1).

10.6. The area of the storm jib shall be $< 0.1 \cdot (SM + SJ)$. See Annex 1

10.7. The maximum number of sails (NS) allowed on board in addition to the storm jib shall be $NS < (LOA/1.6)$ with a max of 8.

11. LIGHTWEIGHT **W**, RATED WEIGHT **RW**

11.1. The lightweight weight **W** is the weight of the multihull in the following conditions:

11.1.1. Fully rigged with all spars (including bowsprits and spinnaker poles if applicable), standing rigging, backstays, shrouds, and halyards.

11.1.2. Main engine installed or outboard engine on board.

11.1.3. Trampolines and nets

11.1.4. Batteries

11.1.5. Mattress/bunk cushions installed on board in their normal position if on board during racing.

11.1.6. All permanent fittings (including galley), furniture items whether removable or not, saloon table (if installed for racing) on board in their normal position.

11.1.7. No more than one mainsail and one headsail on a fixed forestay and their sheets and vangs.

11.1.8. Anchor, chain and/or cable for the main anchor.

11.1.9. Mooring ropes and fenders.

11.1.10. **All the above items must be noted on the certificate and all items included in the “Lightweight” must be present on board during the race. The AMH or**

representative association reserves the right to carry out inspections during the races.

11.2. The following equipment must be removed for weighing:

11.2.1. Spares for standing and running rigging.

11.2.2. Sails on flying forestay, storm jib, gennaker, spinnaker including their furlers and sheets.

11.2.3. Secondary anchorage.

11.2.4. Tools and spare parts.

11.2.5. Non-fixed navigation equipment: light and tide books, charts, guides

11.2.6. Safety equipment (e.g. life belts, fire extinguishers, rockets, hand held radios, life raft, grab bags...).

11.2.7. Fuel, water and contents of any other tanks. Spare gas cylinders must be removed.

11.2.8. Cooking utensils

11.2.9. Food.

11.2.10. Clothing, bed linen, sleeping bags and personal effects.

11.2.11. Crew.

11.2.12. Where for practical reasons it is not possible to remove all items and equipment (e.g. fuel), it is acceptable to deduct the weight of these from the gross weight. The AMH reserves the right to refuse this data where insufficient details are provided.

11.3. The weight will be determined by an approved measurer: either measured using a calibrated electronic scale, or calculated using the freeboard method if the geometry data is also shared.

11.4. Failing this, the AMH or any other source it deems relevant. This will generally result in a reduction in weight. If no weighing takes place within 9 months, an additional penalty of 10% will be applied.

11.5. The rated weight RW becomes:

$$RW = W - 1.7 \cdot RL^2 + 59 \cdot LMH + 50$$

The formula uses a different length criterion LMH, length of the main hull, in order to

correct a bias caused by designs with floats extending forward of the central hull of certain trimarans. For a trimaran it is the length of the central hull. For a catamaran, it is the length of the hull, therefore LOA.

- 11.6. If an owner considers that the RW underestimates the total weight of the boat ready to race with the crew members on board, he has the option of providing the AMH with a detailed inventory of the weights on board "P" to be added to the lightweight weight W and which must be present on board at each regatta. After studying the request, the AMH may decide to take a calculated weight $RW = W + P$. This option will only be possible if the boat has an official weighing certificate determining W.
- 11.7. Special case of light sport catamarans and trimarans (Dayboat). The calculated weight $RW = W + 80 + n \times 80$ per crew member with a maximum of 3.

12. POWER COEFFICIENT **CP**

- 12.1. The power coefficient reflects the ability of the boats to use the entire sail plan, by determining the average sail area. The power coefficient CP (<1) is a function of the aerodynamic torque divided by the righting moment. It takes into account the BOA width of the boat. It applies to the total rated surface RS (see section 8).
- 12.2. The FL coefficient is designed to address the problem of designs featuring low volume floats, very short floats, banana floats and which therefore have volume, but unexploited. It is integrated into the calculation of the CP. This coefficient will be taken into account at the request of the owners who will have to provide the AMH with the float measurements. As a minimum: length, height, width and type of floats. See Appendix 2.

13. APPENDICES, **Q** FACTOR

A corrective factor Q is applied according to the type of the appendage: fixed or pivoting centerboard, daggerboards, hydrofoils;

13.1. Appendage factor for fixed keel: $Q = 0.907 + 1.55 \cdot (TE/RL) - 4.449 \cdot (TE/RL)^2$

13.2. Appendage factor for pivoting centerboard: $Q = 1.033$

13.3. Appendage factor for daggerboards: $Q = 1.036$

13.4. Appendage factor for rudder with lifting surface and/or inclined or curved lifting centers in the outer hulls: $Q = 1.050$

13.5. Appendix factor for foils capable of supporting the multihull out of the water (hydrofoils):

$$Q=1.100$$

14. ENGINE AND PROPELLER, **PF** FACTOR

A propeller correction factor PF is as specified below:

- 14.1. outboard engine or lifting base: $PF=1.0$
- 14.2. one folding or feathering propeller: $PF=0.996$
- 14.3. two folding or feathering propellers: $PF=0.992$
- 14.4. one fixed-blade propeller: $PF=0.984$
- 14.5. two fixed-blade propellers: $PF=0.968$

15. HABITABILITY, **HF** FACTOR

A corrective factor for headroom HF is applied according to habitability:

$HF = 1$, if $HSB \geq HM$ (base height),

Otherwise, if $HSB < HM$: $HF = 1 + 0.3 \cdot (HM - HSB) / 1.96$ with a max of 1.05

Special case "Dayboat" (see 11.4 and 14.4): $HSB="0"$ and $HF = 1.07$

15.1. The accommodation conditions to be met are:

15.1.1. The minimum number of berths of adequate size suitable for use at sea $> LOA/2.13$ rounded.

15.1.1.1. Minimum berth length: 1.90m

15.1.1.2. Minimum width of berth on 1.25m length: 0.55m

15.1.1.3. Minimum width of berth at foot: 0.45m

15.1.1.4. Minimum height above mattress: 0.55m

15.1.2. A bench seat minimum length: $LOA/4.26$

15.1.2.1. Minimum depth of bench seat: 0.40m

15.1.2.2. Minimum height from floor to cushion: 0.35m

15.1.2.3. Minimum height above cushion: 0.85m

15.1.2.4. The bench seat can be combined with berths

15.1.3. A properly mounted cooking stove. Adequate fuel gas securely stowed. Adequate utensils for normal crew complement.

15.2. Basic headroom HM

15.2.1. if $LOA \leq 8m$: $HM=1.22m$

15.2.2. if $8m < LOA \leq 15.20m$: $HM = 0.108333 * LOA + 0.353$

15.2.3. if $LOA > 15.20m$: $HM = 2m$

15.3. Conditions for measuring headroom HSB

15.3.1. Minimum floor length over 0.30m of width: $0.2 * LOA$

15.4. Multihulls that do not meet the minimum accommodation requirements defined in 15.1, 15.2 and 15.3 will be considered as "Dayboats" and thus identified on their Multi2000 certificate with a headroom recorded as "0".

16. CARBON MAST, **MCA**

A correction factor MCA will be applied for carbon masts

16.1. **MCA** = $1 + 0.008 * (ML/RW)^{0.355}$

17. CANTING MAST, **MK**

A correction factor **MK**=1.07 will be applied for canting masts

18. AGE ALLOWANCE, **AA**

A correction factor for age allowance AA shall be calculated using the formula:

AA = $1 - 0.000325 * (\text{Age of the multihull capped at 40 years})$.

The age of the boat is defined by the year of the last structural and/or geometry modification of the platform.

19. SEAWORTHINESS AND SAFETY

19.1. The issuance of a MULTI2000 certificate does not imply that a multihull is necessarily of good quality, of safe design or seaworthy. For races using the Multi2000 rating system, the organizers are responsible for selecting the design category and safety equipment of the competing boats. They are required to notify this in the notice and/or sailing instructions.

Multi2000 specific requirements:

19.2. Structural characteristics, stability and fixed equipment

19.2.1. Regardless of the notice or sailing instructions the following items must always be on board a multihull racing to the Multi2000 rule

19.2.2. A bilge pump and bucket

19.2.3. A pump capable of operating in the floats

19.2.4. An engine. Otherwise see 13.1

19.2.5. A compass

19.3. Portable equipment

19.3.1. Regardless of the Sailing Instructions, the following items must be on board:

19.3.2. An anchor with suitable chain and rope.

19.3.3. Red hand lights

19.4. Personal Equipment

19.4.1. Regardless of the Sailing Instructions, regattas sailed to the measurement, the following items must be on board:

19.4.2. Life jackets, one for each crew member.

20. LIST OF ANNEXES

20.1. Annex 1 - Rating Calculation Formulas

20.2. Annex 2 - Calculation of CP Power Coefficient

20.3. Annex 3-1 - Input Data Form

20.4. Annex 3-2 - MULTI2000 Rating Certificate

