

THE A/B CATEGORY RULES

CHAPTER 1

DEFINITION AND CLASSIFICATION

1.1. A speed cord model is a freely constructed model with its own buoyancy, equipped with an internal combustion engine (ICE) or an electric engine which starts the water or air propeller. The model is tethered to the cord mast with a cord metal thread and moves in a circle whose center is the cord mast. The aim of the competition is to cover a certain number of complete circles (base) at the highest speed possible.

1.2. A/B category includes the following classes:

Class A1	speed cord model equipped with an ICE and set into motion with a water propeller. The working capacity of the engine is up to 3.5 cm ³ , model weight is up to 1.2 kg and the maximum diameter of the exhaust port is not more than 7.0 mm;
Class A2	speed cord model equipped with an ICE and set into motion with a water propeller. The working capacity of the engine is up to 7.5 cm ³ , model weight is up to 2 kg and the maximum diameter of the exhaust port is not more than 8.0 mm;
Class A3	speed cord model equipped with an ICE and set into motion with a water propeller. The working capacity of the engine is up to 10 cm ³ , model weight is up to 2.5 kg and the maximum diameter of the exhaust port is not more than 10.0 mm;
Class B1	speed cord model equipped with an ICE and set into motion with an air propeller. The working capacity of the engine is up to 2.5 cm ³ , model weight is up to 0.75 kg and the maximum diameter of the exhaust port is not more than 5.0 mm;
Class A1E	speed cord model equipped with an electric engine and set into motion with a water propeller. The battery voltage is up to 42.3 V and model weight is up to 1.2 kg
Class B1E	speed cord model equipped with an electric engine and set into motion with an air propeller. The battery voltage is up to 42.3 V and model weight is up to 0.75 kg.

CHAPTER 2

MODEL CONSTRUCTION REQUIREMENTS

2.1. Speed cord models should possess their own buoyancy when their engines are disabled.

Ship Model Sport International Federation

Models of classes B1 and B1E should be constructed in such a way as to ensure that the air propeller is above water while in any position (when the model is placed on water without a fixed cord).

2.2. A model must be the competitor's property. The model must be marked with the competitor's personal license number provided by the national federation.

2.3. The model propulsion system must consist of industrially manufactured parts.

The engine capacity must comply with the capacity of an industrially manufactured engine. For a self-manufactured engine or when the capacity of an industrially manufactured ICE has been changed, the actual capacity is determined using measurements, and their results are written down in the measuring protocol. The measuring protocol is also used in doubtful cases to ensure that the actual ICE capacity complies with the conditions of these Rules.

2.4. Fastening elements of the models and requirements for them.

2.4.1. Cord bridle.

Cord bridle is an element of a model. It includes a loop for attaching to the cord. The strength and diameter of the bridle must not be less than the strength and diameter of the cord in the appropriate class. The length of the cord bridle is 1220 mm measured from the middle line of the model to the cord attachment point. The middle line of the model is the projection of the propeller rotation axis onto the plane of the cord. When a model is fitted with two propellers, the middle line of the model is the middle line between the axes of the propellers.

It is not allowed to launch models with a bridle length less than 1220 mm or the bridle diameter is less than the specified diameter in the corresponding class.

2.4.2. Cord.

The nominal length of the cord is 14552 mm. The cord and bridle must be made of steel with a tensile strength of at least 180 kg/mm².

The cord diameter and its minimum tear strength are determined separately for each class:

Classes A1; B1; A1E; B1E: 0.6 mm, the minimum tear strength – 50 kg;

Class A2: 0.8 mm, the minimum tear strength – 90 kg;

Class A3: 1 mm, the minimum tear strength – 140 kg.

The design of the cord and bridle must comply with Appendix No. 4.1. A competitor is personally responsible for damages that may occur as a result of violation of the present paragraph of the Rules.

The senior start place referee must check the cord for strength before each start of the model using a dynamometer. The cord is provided by the competition organizer.

Ship Model Sport International Federation

2.4.3. Cord mast

There should be a vertical mast (metal pipe) in the center of the cord circle. A coupling with a carabiner is used to attach the cord to the mast. The coupling with the carabiner rotates on a ball bearing and is fixed to the mast. The distance from the mast axis to the attachment point of the loop on the coupling should be 152 mm.

The coupling must be installed in such a way that the cord is at a height of 480 to 520 mm above the water surface. The height of the cord installation is not allowed to be changed during the attempt.

2.5. Fuel for models with ICE

Fuel consisting of 80% methyl alcohol and 20% castor oil is allowed for use.

The refueling referee controls fuel that the model tank is filled up with as well as fuel available to the competitor in an additional container during the start. A model with an empty tank and an additional container must be presented to the referee for control before the start. The referee or the competitor under the referee's supervision refuels the model and the additional container immediately before the competitor is called to the start.

To avoid non-competitive conditions for competitors, it is recommended to refuel models and additional containers from the same cistern.

If it is revealed that a competitor uses fuel that does not comply with the Rules, he/she is disqualified.

2.6. Requirements for models equipped with an electric engine (A1E B1E Classes)

2.6.1. It is necessary to use a remote-control system for smooth switching on/off the electric engine and controlling its speed. The electric engine must be controlled by the competitor himself/herself during the attempt.

2.6.2. Each competitor is responsible for compliance with the maintenance rules regarding their batteries and all consequences resulting from their violation.

2.6.3. A competitor must store, transport, charge and warm up the battery only in special fireproof bags or containers. The temperature of the batteries before the start must not exceed 40 degrees Celsius.

2.6.4. All models must be equipped with an electronic circuit breaker (ECB). The ECB must interrupt power supply from the battery to the electric engines that rotate the model propellers so that the engines could be switched off in any situation.

2.6.5. If a model is equipped with several batteries, then it must be equipped with ECBs to open all electric circuits with batteries.

2.6.6. It is allowed to install an ECB on either side of the model. The ECB loops must be red in color and constructed according to Appendix No. 2.1.

Ship Model Sport International Federation

2.6.7. The ECBs must be mounted in such a way that anyone can interrupt the power supply from the battery to the model as quickly as possible in case of emergency. It is forbidden to install the ECB on removable covers or any other movable parts of the models. It is prohibited to install the ECB under sliding covers.

2.6.8. The technical commission checks functioning of the ECB and also before each attempt, the senior start place referee performs the ECB checkup. If the ECB does not comply with the rules, the competitor is not allowed to start.

2.6.9. If, for some reason, rescuers or any other persons authorized by the organizer cannot open the electric circuit with the help of the ECB on the competitor's model during the attempt, the competitor is disqualified from this attempt.

2.6.10. It is not allowed to overcharge of the battery. This is controlled by direct measurement of the battery voltage at its terminals and comparing the measurement result with the maximum allowable battery cell voltage multiplied by the number of cells in the battery, according to Appendix No. 2.2. The competitor is obliged to inform the referees who monitor batteries at the start of the type and number of cells used in his/her battery. Exceeding the maximum permissible voltage means that the battery is overcharged. The competitor is not allowed to start in this case.

2.6.11. Batteries that have lost their original shape and dimensions (swollen) should no longer be used for safety reasons. It is forbidden to compress swollen battery cells with any device to return them to their original shape and dimensions, whether before using them, after charging or after a race, inside or outside the models. The battery status control is carried out immediately upon the end of the attempt. Swollen batteries must be immediately removed from operation and stored in appropriate conditions until their disposal. Batteries of any type must be collected for disposal at the competition venue in special containers. The organizer must ensure that the battery disposal containers are available to competitors at the start place.

CHAPTER 3 COMPETITION COURSE, ITS LENGTH AND PASSAGE CONTROL

3.1. The competition site should be located on a calm water surface so that the competitors can start the models while standing in water.

The water depth at the start place should be 600 – 800 mm.

3.2. The start place (if possible, the entire water area) must be fenced off from the spectators, participants and referees with a metal mesh at least 1.8 m high.

Ship Model Sport International Federation

3.3. The competition course must be constructed in accordance with Appendix No. 4.2.

The course (or base) length is 500 m, which corresponds to five complete circles (with the estimated dimensions of the coupling with the ball bearing, the cord and bridle with the loop.).

3.4. Before the competition begins, the senior start place referee should check:

- construction and dimensions of competition facilities;
- buoyancy of models (classes B1 and B1E);
- bridle dimensions on models.

During the competition, the senior start place referee should monitor the use of prescribed cords in the appropriate classes. The senior start place referee can apply other types of control if necessary for safety reasons.

CHAPTER 4 COMPOSITION OF THE REFEREE PANEL AT THE CORD CLASSES START PLACE

The composition of the referee panel at the start place is defined in Chapter 10 (Table No. 4) “Functional duties and rights of the chief referee panel” of SMSIF International Referee Rules.

CHAPTER 5 COMPETITION PROCEDURE

5.1. A maximum of 5 attempts must be carried out during one competition.

5.2. The preparation time for the start of the model is 4 minutes.

5.3. The competitors decide on their own in which direction their models will start.

5.4. Each competitor has the right to start only once during one attempt. It means that the model may not start twice during the preparation time, even if the competitor has time to prepare his/her model for a new start after a failed start before the preparation time is over.

5.5. The competitor informs about the beginning of the evaluation (timing) by clearly raising his/her hand. If the competitor does not inform about the beginning of the evaluation during the preparation time, this attempt is not evaluated.

5.6. Time measurement begins after the competitor’s timing signal, when the model crosses the start line between the mast and the start sign. One of the

Ship Model Sport International Federation

timekeepers must loudly count the laps completed by the model. The time measurement ends after the model completes the fifth lap.

5.7. If the starting model does not complete the required 5 laps during the time measurement, this attempt is not evaluated.

5.8. During the evaluation, a B1 or B1E Class model must touch the water surface at least twice per lap.

5.9. Radio control may be used to start and stop models equipped with an electric engine (A1E, B1E Classes). During the timing of the course passage, the transmitter may not be used and must be raised above the competitor's head or placed on the timekeepers' table. In case this point of the Rules is violated, the result of the attempt is not counted.

CHAPTER 6 EVALUATION OF RESULTS

6.1. The time it took the model to complete the course in an attempt, as measured by the timekeepers, is converted into speed (km/h). This speed is the competitor's result in an attempt.

6.2. To determine a competitor's place in the competition, the best result from all his/her attempts is selected and compared with the results of other competitors. The competitor whose model achieved the highest speed in the class becomes the winner in this class, the remaining places are ranged in the descending order of results.

6.3. If several competitors achieve the same result in their best attempts, then the higher place is awarded to the first competitor who has achieved this result.