



Sumo

1. General provisions

1.1. Field

- 1.1.1. The field is shaped as a round ring.
- 1.1.2. Ring color — black.
- 1.1.3. Field diameter:
 - Category “Intellectual Sumo” — 77 cm
 - Category “Mini Sumo” — 77 cm
 - Category “Micro Sumo” — 38.5 cm
- 1.1.4. The ring border is marked with a whiter line.
- 1.1.5. Ring border width:
 - Category “Intellectual Sumo” — 2.5 cm
 - Category “Mini Sumo” — 2.5 cm
 - Category “Micro Sumo” — 1.25 cm

2. Requirement to Robots

2.1. Main specifications

- 2.1.1. The robot size at the start must not exceed:
 - Category “Intellectual Sumo” — 15 x 15 cm
 - Category “Mini Sumo” — 10 x 10 cm
 - Category “Micro Sumo” — 5 x 5 cm
- 2.1.2. Robot height:
 - Category “Intellectual Sumo” — unrestricted.
 - Category “Mini Sumo” — unrestricted.
 - Category “Micro Sumo” — 5 cm
- 2.1.3. In the process of motion, the robot sizes may change.
- 2.1.4. The robot weight must not exceed:
 - Category “Intellectual Sumo” — 1,000 g
 - Category “Mini Sumo” — 500 g
 - Category “Micro Sumo” — 100 g
- 2.1.5. The robot must be fully self-sustained.

2.2. Additional specifications

- 2.2.1. Allowed are any control mechanisms if all their components are on the robot, the mechanism failing to interact with an external control system (man, machine etc).
- 2.2.2. In the category “Micro Sumo”, robots must be equipped with an IR receiver. For the IR receiver technical specifications, see the appendix. Participants may implement their own hardware solutions or use the pre-assembled module offered by the organizers.
- 2.2.3. No edges of the robot must be sharp enough to scratch or damage the ring, other robots or players. Edges with radius in excess of 0.1 mm are allowed like those of a 0.2 mm thick unsharpened metal strip¹.
- 2.2.4. Parts that might break or damage the ring are prohibited.

¹ The referees and organizers may demand that edges that are, in their opinion, too sharp, be covered with adhesive tape.



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- 2.2.5. Throwing devices/mechanisms are prohibited.
- 2.2.6. Usage of adhesive substances for improvement of maneuvering qualities is prohibited.²
- 2.2.7. Devices increasing downforce (such as vacuum pumps or magnets) are prohibited.

3. Game

3.1. Objective of game

- 3.1.1. Like in traditional Japanese martial arts, robots try to push the rival outside the ring.
- 3.1.2. Match duration³:
 - In the categories “Intellectual Sumo” and “Mini Sumo”, the match consists of maximum three rounds, 90 seconds each.
 - In the categories “Micro Sumo”, the match consists of three rounds with total duration not in excess of 3 minutes.
- 3.1.3. By the referee’s decision, the match may be prolonged but by no more than 3 minutes.
- 3.1.4. Be the referee’s decision, the match may be discontinued ahead of time.

3.2. Start

- 3.2.1. At the start, the robots must be positioned in the ring, in two opposite quadrants⁴.
- 3.2.2. Each robot must be oriented away from the rival (as shown by the arrows on the cross).
- 3.2.3. The robot may be positioned anywhere within the quadrant.
- 3.2.4. As soon as he teams has fixed their positions, the referee removes the cross and the participants may not relocate the robots anymore.
- 3.2.5. In the categories:
 - “Intellectual Sumo” and “Mini Sumo”: the robot must be manually activated or initiated at the contest start by the referee’s signal; after that the robot work is not to be interfered with. Remote control and issue of any commands for the robot are prohibited.
 - “Micro Sumo: the referee begins each round by sending a start signal from an IR transmitter. The robot having received the signal, the round begins immediately, without any delay.

3.3. Rematch

- 3.3.1. A rematch is declared in the following cases:
 - The robots have been rotating relative each other without any development for 5 seconds⁵.
 - The both robots has stopped and remained motionless for 5 seconds, without touching each other⁶.
 - Nomination of the winner is imposable.

3.4. Round end

² the tires and other robot components that are to contact the ring must hold an A4 sheet of paper in a lifted position (80 g/m² for no more than 2 seconds).

³ The standard delay before the match must not exceed 30 seconds. The delay is not counted towards the match time.

⁴ The quadrants are marked with the help of the cross that is placed in the center of the sumo ring.

⁵ If it is unclear whether there is development, the referee may increase the observation time to 30 minutes.

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3.4.1. The round ends if:

- The rival robot has touched the space outside the ring with any part of its body.
- The rival robot has stopped and remained motionless for 5 seconds⁷.

3.5. Finish

3.5.1. The match ends by the referee's decision.

4. Winner nomination rules

4.1. The team score 1 point for victory in each round.

4.2. The team having scored 2 points is nominated the match winner.

4.3. In case Subclause 3.3. is not to be satisfied, the referee has the right to independently nominate the winner relying on the following parameters:

- Robot motion and functioning technical peculiarities;
- Penalty points scored during the match;
- Players; attitude during the match.

4.4. The referee also has the right to award points to the rival team in case of violation of the procedural rules and/or failure to comply with the referee's instructions.

4.5. The competition arrangement system envisages two stages:

- The first stage is played in groups.
- The second stage is that of play-off⁸.

4.6. The team having scored the maximum points in their groups proceed from the first stage to the second one^{9,10}.

⁷ Except for Subclause 3.3.1.

⁸ Be decision of the Organizing Committee, the second stage may be canceled.

⁹ The number of teams qualifying from the groups is determined by the Organizing Committee on the competition date.

¹⁰ Should determination of the teams qualifying for the next stage be impossible, the robots having the minimum weight qualify.