

# Rules for sumo During Swedish Robotics Championship

## Changelog:

- *2015-02-11 – Updated rules for Lego sumo (2.9, 4) and specified which classes require start module (2.6)*
- *2014-02-18 - New figure to explain the placement*
- *2014-02-26 - Wood is given as an alternative material for standard sumo and will be used if there is enough interest.*

## Rules at a glance

The rules for sumo are based on what is called “Sumo, Japanese class”. The purpose of the game is to make the opposing robot leave dohyo. The complete rules follows below. Use your common sense when interpreting the rules. If you have any questions about them, please contact us at: [info@robotism.se](mailto:info@robotism.se).

## Rules for Standard/Mini Sumo

### 1. Goal

1. The purpose of the game is to make the opposing robot leave the dohyo . A robot counts as out when any part of the robot touches any surface other than the top surface of the dohyo. If something would fall of the robot and drop outside the dohyo, the robot counts as out and has thereby lost that round.

### 2. The Robot

1. The robot has to be mobile (be able to move from its own power) and autonomous (no external control is allowed)
2. The robot may be altered between matches (not rounds) as long as the rules are followed. All physical alteration of the robot must be reported to the championship staff for approval before its next match. Alteration of the software does not have to be reported.
3. The robot may not be in a way that may cause it to harm any other robot, any human or its surroundings. Normal pushes and bangs are not considered as “harm another robot”.
4. The robot may not:
  - 4.1. Emit any gases, liquids or powder
  - 4.2. Scratch or in any other way intentionally damage the surface of the course.

- 4.3. Actively try to jam the other robot with e.g. EMP or other disturbance signals
- 4.4. Fire projectiles.
- 4.5. Use anchoring devices such as vacuum fans or suction cups. For the standard class, certain types of anchoring equipment is allowed. Note that the robot still has to pass the “paper” test, see point 2.5,
- 4.6. Fly as a result of its own power.
5. If the robot in active mode is placed on top of a piece of paper (standard A4 printing paper) and then lifted straight up, the paper must not stick to the robot for more than 1 second.
6. The robot must be prepared for remote start according to the document “System for starting sumo robots”. This only applies for the classes Standard, Mini, Micro and Nano.
7. The size of the robot must not exceed the lengths given in the table below. Please note that these size restrictions are only mandatory before the referee has given the start signal.
8. The mass of the robot must not exceed the weights in the table below.
9. Special rules for Lego sumo: The robot may only be built from LEGO® parts. This includes
  - 9.1. All parts produced and distributed by LEGO®.
  - 9.2. All parts manufactured by a third party and licensed by LEGO®.

<b>Class</b>	<b>Mass (g)</b>	<b>Size (width x depth x height, cm x cm x cm)</b>
Standard	3000	20 x 20 x unlimited
Mini	500	10 x 10 x unlimited
Micro	100	5 x 5 x 5
Nano	25	2.5 x 2.5 x 2.5
Pico	5	1.25 x 1.25 x 1.25
Lego	1000	15 x 15 x unlimited

### 3. Inspection

1. The championship management has the right to do additional inspections of the robots at any time they see fit during the competition.
2. The championship staff will also check the start-up sequence and inform the contestant if there may be any problems (such as it has a scoop which may fall out during the countdown). The front and back of the robot is checked since this matters during the placement procedure (see 6.2). If there are any doubts, the front direction is decided by the championship staff.
3. The championship staff has the right to demand changes to the robot if the it is not compliant to the rules.
4. If you cannot perform the changes you have been instructed, you may lose the round, the match or in extreme cases be disqualified from the competition.

#### 4. Dohyo (see pictures in the bottom)

1. The dohyo consists of a round board with a diameter given in the table below.
2. The surface is painted black, except for a white border with width defined in the table below.
3. The height of the dohyo surface above the ground is at least the defined length in the table below.
4. Around the dohyo, there is an area called “ring area”. In the ring area, nothing or no one (except for the robots and the dohyo) be located. The ring area is fat and reaches at least the distance from the edge of the dohyo defined in the table below.
5. The material of the dohyo is defined in the table below.

<b>Class</b>	<b>Diameter (cm)</b>	<b>Height above the floor (cm)</b>	<b>Edge line width (cm)</b>	<b>Ring area size (cm)</b>	<b>Material</b>
Standard	154	5	5	100	Steel/Wood
Mini/Lego	77	2.5	2.5	50	Wood
Micro	38.5	1.25	1.25	25	Wood
Nano	19.25	0.625	0.625	25	Wood/Acrylic
Pico	9.625	0.3125	0.3125	25	Wood/Acrylic

#### 5. The competition

1. A round is never more than 3 minutes long. If no robot leaves the course before the time is up it the round is declared a draw.
2. The match is played as best of 3 rounds (5 rounds in the endgame). In the group game, a match may end in a draw. If a match in the endgame is a draw after 5 rounds, additional rounds are played until one robot is victorious. If there is a shortage of time, the number of rounds during the endgame may be cut to 3. If the match has gone on for a large number of rounds without a robot winning, the referee may declare judgement. If the following round also ends in a draw, the most active robot will be declared winner.
3. The robot must be ready to start at the appointed time. If it is not ready the judge may declare the opposing team as winners of the match.
4. First both robots are placed according to the rules below (in chapter 6). Note that only one member from each team may approach the dohyo. Afterwards, the referee will remove the cross dividing the dohyo in its four quadrants. The competitors ready their robots for start and the leaves the ring area together with the referee. The referee asks the competitors if they are ready and the sends the signal allowing the robots to start (see point 2.6). Before the referee has given the start signal, the robots may not move. The are allowed to move some parts (such as sweeping with a sensor) as long as these movements does not violate the size restrictions. Om a robot moves or violates the size

restrictions before the referee has sent the start signal it counts as a false start. A robot may perform one false start each match. Additional false start will give make the robot lose the round. It is allowed to stop the match before the referee has sent the start signal as long as the robot is still compliant to the rules. This does not case loss of the round.

5. The competitors are allowed to stop the round at any moment by either signalling to the referee or stepping into the security area. If this is done the round is lost and the opposing team wins the round.
6. The competitors are also allowed to agree to stop the round (i.e. if the robots get stuck on each other and no progress is made). If so, the round is considered a draw.
7. The competitors may take a 5 minute break to adjust the robot. This is allowed only once per match. If possible, next match can be carried out during this break.
8. If the judge considers the rules to be violated by one robot the opposing competitor wins the round. In the case grave faults the match is lost.

## 6. Placement

1. At the beginning of each match chance determines which team is to be the first to put its robot on the course.
2. The referee puts a cross in the middle of the dohyo. This cross has two arrows and splits the dohyo into 4 quadrants, with two quadrants specially marked (see pictures at the bottom for further explanations). The first competitor then places his or her robot somewhere in the quadrant instructed by the referee with the front facing in the direction of the arrow. After placement the robot may not be moved.
3. After the first competitor is done the other competitor places his or her robot in the same fashion.
4. In the next round the winner of the previous round places out his or her robot first. If the previous round was a draw, the order of placement is the same as the previous round.

## 7. Rule conflicts

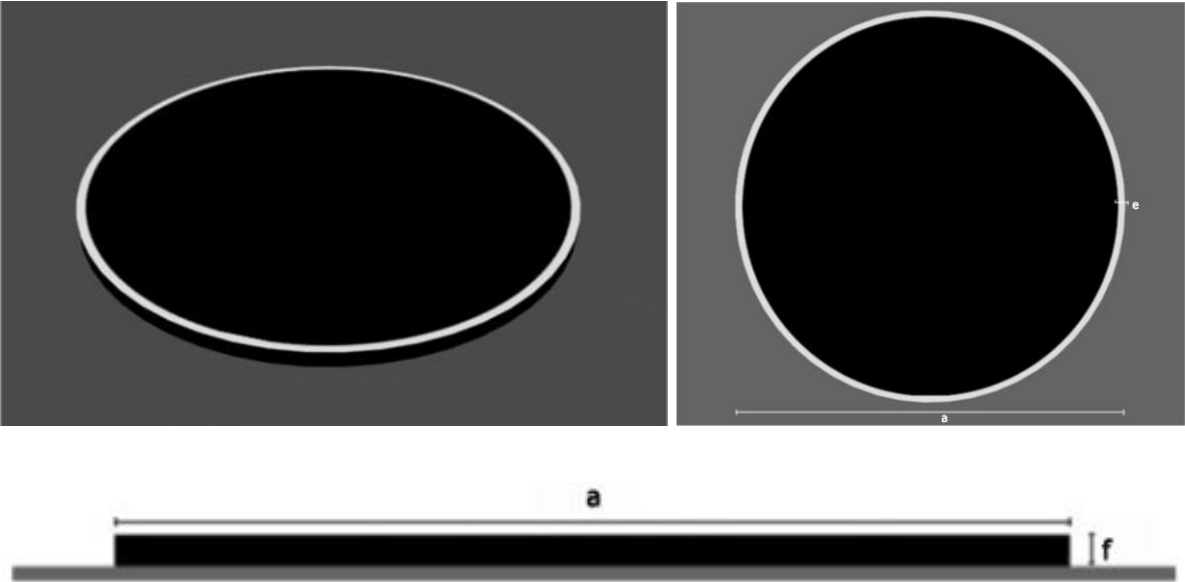
1. Use your common sense when interpreting the rules. If there are any rule conflicts, the main referee has the final word to say what is right and what is wrong.

## 8. Quick reference

(See also the pictures below)

<b>Class</b>	<b>Mass of the robot(g)</b>	<b>Size of the robot (width x depth x height, cm x cm x cm)</b>	<b>Diameter (cm) (measure a)</b>	<b>Height above the floor (cm) (measure f)</b>	<b>Edge line width (cm) (measure e)</b>	<b>Size of the ring area (cm)</b>	<b>Material</b>
Standard	3000	20x20	154	5	5	100	Steel/Wood
Mini	500	10x10	77	2.5	2.5	50	Wood
Micro	100	5x5x5	38.5	1.25	1.25	25	Wood
Nano	25	2.5x2.5x2.5	19.25	0.625	0.625	25	Wood/ Acrylic
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Lego	1000	15x15	77	2.5	2.5	50	Trä

9. The Dohyo



Conceptual picture of the placement

