LEGO Sumo Competition Rules

This document sets out the LEGO Sumo competition rules applied at competitions organised by Šiauliai Robotics Club (Šiaulių robotikos klubas).

1. ROBOT CLASS

Only autonomous robots may compete.

2. COMPETITION

2.1. Basic rules

A participant may enter only one LEGO Sumo group and register only one robot. A robot is registered with one operator and several assistants. Only the operator may start and stop the robot. All participants must follow the competition rules. Bouts take place in the ring (Dohyo) between autonomous robots built by the participants themselves. The winner is announced by the judges.

2.2. Competition procedure

The organisers determine the course of the competition according to the number of participants. If there are many participants, sub-group bouts are held first to select the final tournament participants. The final tournament is played as double elimination (group tournament and play-offs). If there are few participants, the organisers may determine the winner by a group tournament only. If there are very many participants, the organisers may use play-offs until a set number of robots remain and then determine the winner by a group tournament.

3. COMPETITION AREA (DOHYO JYONAI)

The competition area (Dohyo Jyonai) consists of the ring (Dohyo) and the area around the ring (Yochi). Everything else is outside the competition area (Dohyo Jyogai). The ring is a black circle (see Fig. 1).

Table 1. Ring parameters

Height	Diameter	Material
1–5 cm	77 cm	wood / plastic

3.1. Placing the robots

A starting cross is placed in the middle of the ring, dividing it into four equal sectors. The robots are placed in two diagonally opposite sectors (see Fig. 1). The competitor chooses the robot's position within the sector freely, but the robot must at least partly cover the white line (Tawara). When the robots are placed, the referee removes the starting cross. Once placed, the robots may not be moved.

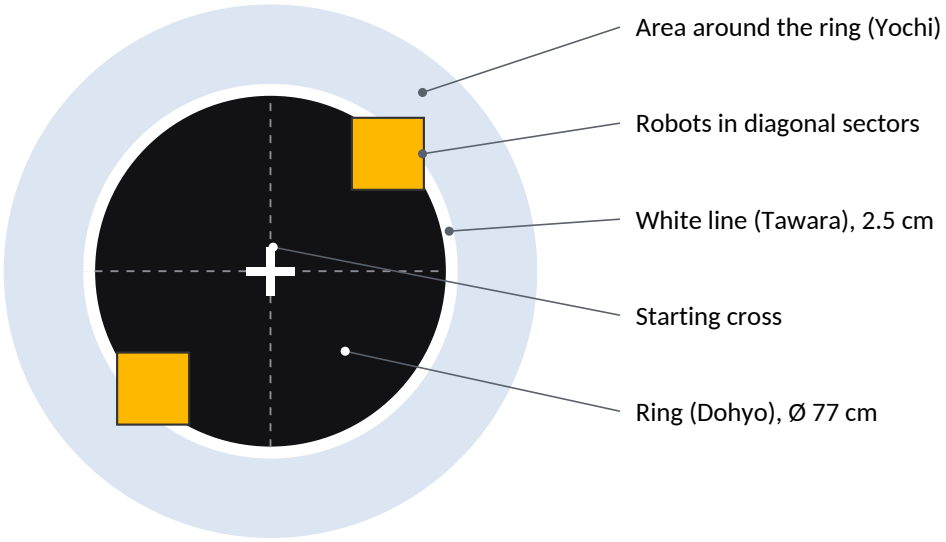


Fig. 1. Competition area and robot placement

3.2. White line (Tawara)

Tawara is the white line along the outer edge of the ring. It is part of the ring. The line is 2.5 cm wide.

3.3. Area around the ring (Yochi)

Yochi is the area around the ring. Its colour and material may vary, but it must not be white. Spectators and competitors not taking part in the bout must keep a safe distance of at least 1 m from the ring.

4. ROBOT REQUIREMENTS

4.1. Size and weight

Table 2. Robot size and weight

Group	Weight	Length*	Width*	Height
LEGO Sumo Junior (up to 12)	up to 1.0 kg	15 cm	15 cm	unlimited
LEGO Sumo Senior (13 and over)	up to 1.0 kg	15 cm	15 cm	unlimited

** The LEGO robot measuring box has a tolerance of +2 mm.*

4.2. Starting the robot

The robot is started with a 5-second delay: the operator presses a button and the robot starts moving after 5 seconds.

4.3. Stopping the robot

The operator stops the robot by pressing a button.

4.4. Autonomous operation

The robot must be sensor-controlled – it must “sense” the opponent’s movements and react or attack accordingly. If there is any doubt whether a robot is autonomous, the judges have the right to check its control program.

4.5. Remote start

If the robot needs to be started with a remote control, this must be agreed with the referee, and the remote control must be handed to the referee after the start.

4.6. LEGO parts

- Only original LEGO® parts may be used, including controllers, motors and sensors.
- Parts must be in their original condition – they must not be sanded, bent, glued, cut or modified in any other way.
- It is forbidden to turn a tyre inside out and/or to put it on top of another tyre already mounted on the wheel.
- Wheels must be in their original condition (e.g. the rim must not be replaced with gears or other LEGO parts).
- The robot must use batteries recommended by LEGO® .

5. MATCH PRINCIPLES

- A match consists of up to three rounds. The robot that first wins two rounds wins the match. A round lasts no longer than 3 minutes.
- Up to 1 minute is allowed between rounds to get the robots in order.
- If no winner is determined within 3 minutes, the referee indicates how the robots are to be placed again (e.g. back to back or side by side) and the round is repeated.

6. CONDUCT OF A MATCH

6.1. Start of a match

When called by the judge, one team member must come to the ring with the robot within 1 minute; otherwise the robot loses the round by technical forfeit. Following the judge's instructions, the competitor places the robot in the ring. The robot must at least partly cover the white line and may not be moved once placed. At the judge's signal, the operator switches on the robot and starts the program. After the start the robot stays still for 5 seconds – during this time the competitors must step away from the ring.

6.2. End of a match

The match ends when the judge gives the signal. The competitors shake hands respectfully, take their robots from the ring and leave the competition area.

6.3. Repeating a round (Torinaoshi)

A round is repeated if:

- both robots are pushing against each other and do not move, or their movement is disturbed, for more than 15 s;
- both robots fall out of the ring at the same time;
- a part that has come off a robot stays in the ring and interferes with the opponent;
- in any other case where a winner and a loser cannot be determined.

If no winner is determined after the repeated round, the referee sets the positions of the robots and the match continues in the remaining time.

6.4. Robot maintenance during the match and breaks

- It is forbidden to take the robot out of the competition area between matches without permission (e.g. if the robot needs repair).
- During a match it is forbidden to deliberately replace parts of the robot or add new ones. A broken part may only be replaced with an identical one.

7. POINTS (YUKO)

A point is awarded when:

- the opponent's robot is pushed out of the ring (touches the area outside the ring);
- the opponent's robot falls out of the ring by itself and touches the area outside the ring;
- the opponent's robot does not move within 10 s of the judge's start signal (i.e. within 5 s after the 5-second delay);
- a part weighing more than 5 g comes off the opponent's robot and falls outside the ring (no point if the part stays in the ring);
- the opponent receives a second warning (Keikoku);
- the opponent decides to end the round.

8. VIOLATIONS AND PENALTIES (HANSOKU)

8.1. Warning (Keikoku)

A warning is given if:

- the operator or any of their belongings enters the competition area before the judge announces the end of the round;
- the robot moves or changes shape before the start of the round;
- the robot is replaced after it has been placed in the ring;
- any other improper behaviour is observed.

After two warnings, the opponent is awarded a point (Yuko).

8.2. Loss due to violation (Hansokumake)

A competitor loses the match if:

- they deliberately prolong the time for getting the robot ready (see Section 5);
- they deliberately disrupt the match (e.g. by damaging or deforming the ring);
- their robot does not meet the requirements of Section 4;
- the robot does not move autonomously.

8.3. Disqualification (Sikkaku)

A competitor is excluded from the competition and from the list of participants and results if:

- their robot does not meet the requirements of Section 4.1;
- they behave discourteously (insult the opponent or the judges, use foul language);
- they intentionally injure an opponent.

9. DISPUTES

Judges' decisions are final. In case of a dispute, participants should contact the Chief Judge. Complaints are accepted only during the event concerned; later complaints will not be considered. The final decision is made by the Chief Judge and/or the organisers. Rude behaviour is not tolerated: a team that does not follow the judges' decisions may be disqualified.

10. ROBOT MARKINGS

Robots are marked with number stickers provided by the organisers.

11. CHANGES TO THE RULES

Any changes to the rules or their cancellation are decided by the competition organisers.