



Robot-Based Manufacturing

RoboFinist competition rules

Version 2.0 dated February 10, 2025

1. General Provisions

The run is held by each team independently. One team plays one robot.

1.1. Task Description

The robot must pick up the «goods» from the conveyor belt and place them in the warehouse according to the nomenclature in a minimum of time.

1.2. Restrictions

A team must meet the following requirements, unless otherwise specified by the Organizing Committee of a particular Event:

- the number of participants in the team is 4 or less (the number of coaches/team managers is not limited)
- the oldest member of the team is 19 years old or less in the year of the competition.

2. Requirements for the Robot

The robot must meet the following requirements:

- length - not more than 400 mm;
- width - not more than 400 mm;
- height - not more than 400 mm;
- weight - not limited.

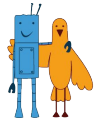
The robot can change its dimensions after the start.

The robot must be absolutely autonomous; remote control in any form is prohibited.

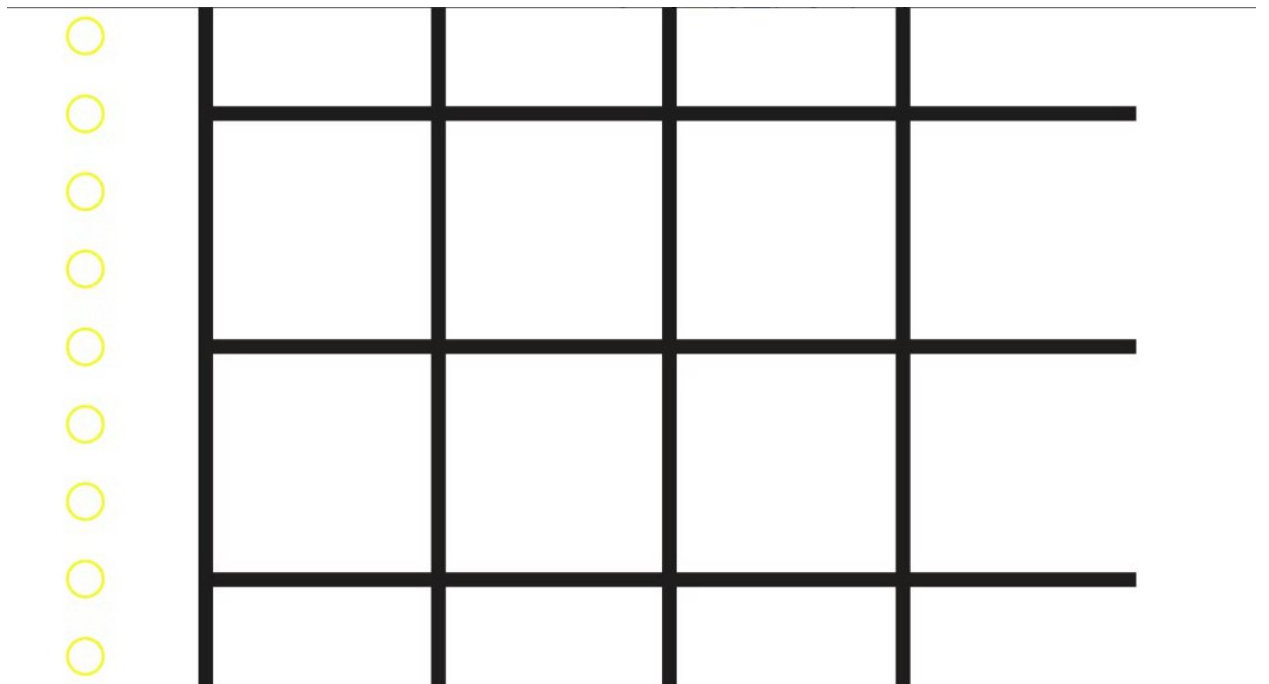
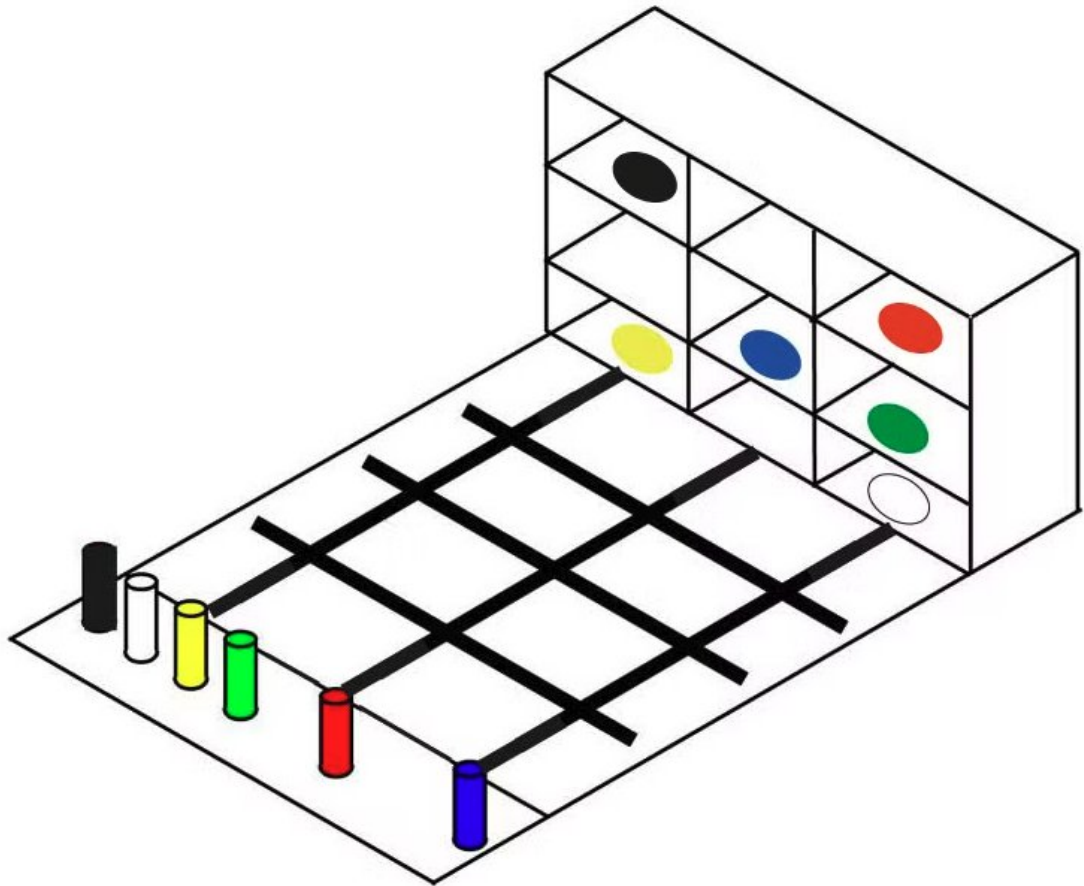
3. Specifications of the Field

The field is conditionally divided into 3 areas: conveyor, warehouse and transport area.

The field is a flat rectangular white surface made of no particular material with black marking lines on it. Optionnally, a one piece banner with a density of 400-500 g/m2.



ROBOFINIST



In the conveyor area, goods ready to be moved to the warehouse are placed stationary. Each good is a cylinder with the following characteristics:

- diameter from 50 \pm 3mm but with thickenings up to 60 \pm 5mm at the top and bottom;
- height - 90 \pm 5mm;
- weight - 50 \pm 5g (optional 50mm double-socket connector).



Each good has a colored marker that allows the robot to identify the appropriate cell in the warehouse.

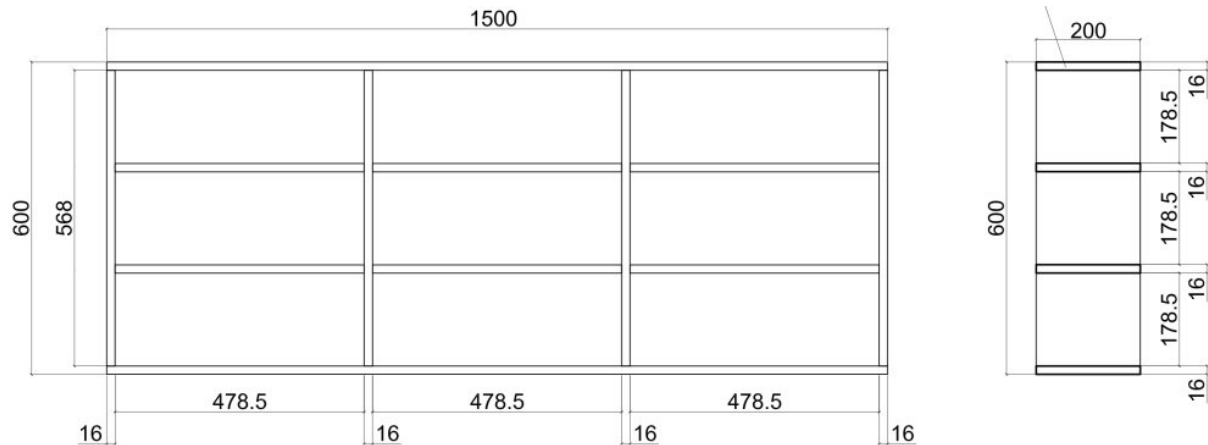
The colored marker is made of colored paper wrapping around the cylinder in its middle part with a width of 55 \pm 10 mm.

Warehouse

A shelf stand for storing goods is fixed in the warehouse area: 3 levels with 3 cells in each.

Shelf stand dimensions:

- width - 1500 mm
- height - 600 mm
- depth - 200 mm
- cell size - 500x200 \pm 10 mm



Transport Area

The transport area is a grid of black lines to facilitate navigation from the conveyor to the warehouse.

Grid characteristics:

- line width - 30 mm;
- grid step - 500 mm.

4. Contest Procedure

The number of attempts is decided by the Organizers on the day of the competition.

The duration of the run is 3 minutes.

On the day of the competition and for all stages, warehouse cells are randomly assigned colors:

1. black - 1 cell
2. blue - 1 cell
3. green - 1 cell
4. yellow - 1 cell
5. red - 1 cell
6. white - 1 cell
7. no color - 3 cells

The operator place the robot anywhere in the transportation area.

Before the start of each run, the location of 6 defferent colored goods in the conveyor area is determined by drawing lots.

The robot must pick up the goods from the conveyor and place them vertically into the appropriate warehouse cells. If not placed vertically, the goods are considered damaged.



One robot can transport only one good at a time. The good must not touch the field outside the conveyor area. If the field is touched, the good is considered damaged and no points are awarded for its installation.

The run stops if

- the field task is fully completed;
- the robot has left the field (any support point of the robot has touched the surface outside the field);
- the run time is over.

The time of the run is recorded directly by the Judge using a stopwatch when the last good is placed in the warehouse cell. The fixed time is final and cannot be reviewed.

4.1. Finals

The final task and the method of calculating the final result are determined by the Judges at the end of the main attempts.

5. Disqualification

The attempt is disqualified if:

- the robot is not autonomous (the robot is under an external control);
- participant touched the robot or the field during the run.

6. Scoring

At the end of the attempt, the robot is awarded points according to the table:

Robot picked up one good off the conveyor	5 points
Correctly installed good on the 1st level of the shelf stand	5 points
Correctly installed good on the 2nd level of the shelf stand	10 points
Correctly installed good on the 3rd level of the shelf stand	15 points
Incorrectly installed good	1 point
Damaged good has been installed	0 point

The attempt with the highest score counts. If the points are equal, the attempt with a minimum of run time counts.



7. Procedure for Determining the Winner

The winner is the team with the highest score.

If the points are equal, the team with the minimum run time gets the advantage.