Jeux de Génie
EngGames 2027
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MACHINE RULEBOOK

JANUARY 3RD TO 7TH 2027 | UNIVERSITÉ LAVAL

36TH EDITION OF THE ENGINEERING GAMES



SEPTEMBER 5TH, 2026 | ENGLISH VERSION

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THE MACHINE COMPETITION

The Machine competition is a challenge where engineering knowledge transforms into concrete solutions. Teams will have to design and build a robotic machine capable of performing different tasks on a predetermined playing field, while respecting the technical constraints of the challenge.

Over the months, participants will have to turn idea into creation. Design, building, programming, testing, and adjustments will be part of the process. Each team will have to find a balance between performance, reliability, and simplicity in order to develop a machine that effectively meets the requirements of the challenge.

The competition will also require good organization and constant teamwork. In the face of technical problems and contingencies, teams will need to be able to analyze the situation, find solutions, and adapt their approach. Trial and error will be part of the journey, as will the many improvements made until the day of the competition.

In January 2027, the machines will be put to the test at the Engineering Games. This will be an opportunity for the teams to put into practice several months of work and to demonstrate their know-how, creativity, and ability to work together.

Designing, testing, improving, and rising to the challenge is what await the Machine teams in 2027.

The Machine Team



Contact us at machine@jeuxdegenie.qc.ca

THANK YOU TO THE OFFICIAL PARTNER OF THE MACHINE COMPETITION!

Cascades

1. MACHINE CHALLENGE FOR 2027

RECYCLOBOT INDUSTRIES

CONTEXT

Welcome in 2067.

The planet is crumbling under waste generated by decades of overconsumption. In order to combat this environmental crisis, entirely ecological waste recovery and processing plants have been established around the world. Their mission is to give a second life to materials that are considered unrecoverable and to transform them into a multitude of reusable products.

RecycloBot Industries, the world's largest recycling company, has just suffered a major breakdown: their two robots, which are essential for the plant's operation, are out of order. Both machines were specially programmed to work as a team to handle and process inputs, to manage product orders, and to ship recycled products.

To prevent production from coming to a complete halt, RecycloBot Industries is requesting your services. You will need to temporarily take over for these machines in order to keep the plant running while they are being repaired.



CHALLENGE PRESENTATION

This year's challenge can be summed up in a few words: "Overcooked" industrial version. The challenge is to fill as many product orders as possible within 7 minutes. Some products will be worth more points, others less, and it will be up to your team to establish the right strategy that will allow you to optimize your time.

To complete the orders, teams will have to take resources located at different locations on the field and go through processing stations with the right input materials to obtain various products (see the input-output diagram). Products will have to be deposited in the Shipping Zone corresponding to the colour of the order on the challenge web interface to score points.

Complicating the situation, the RecycloBot Industries plant is separated by a river that supplies the plant with energy. Consequently, there will be two Starting Zones that can accommodate one robot each. Robots will therefore have to work as a team to collect resources, process them, and trade between them to fulfill the product orders that will arrive one after the other.

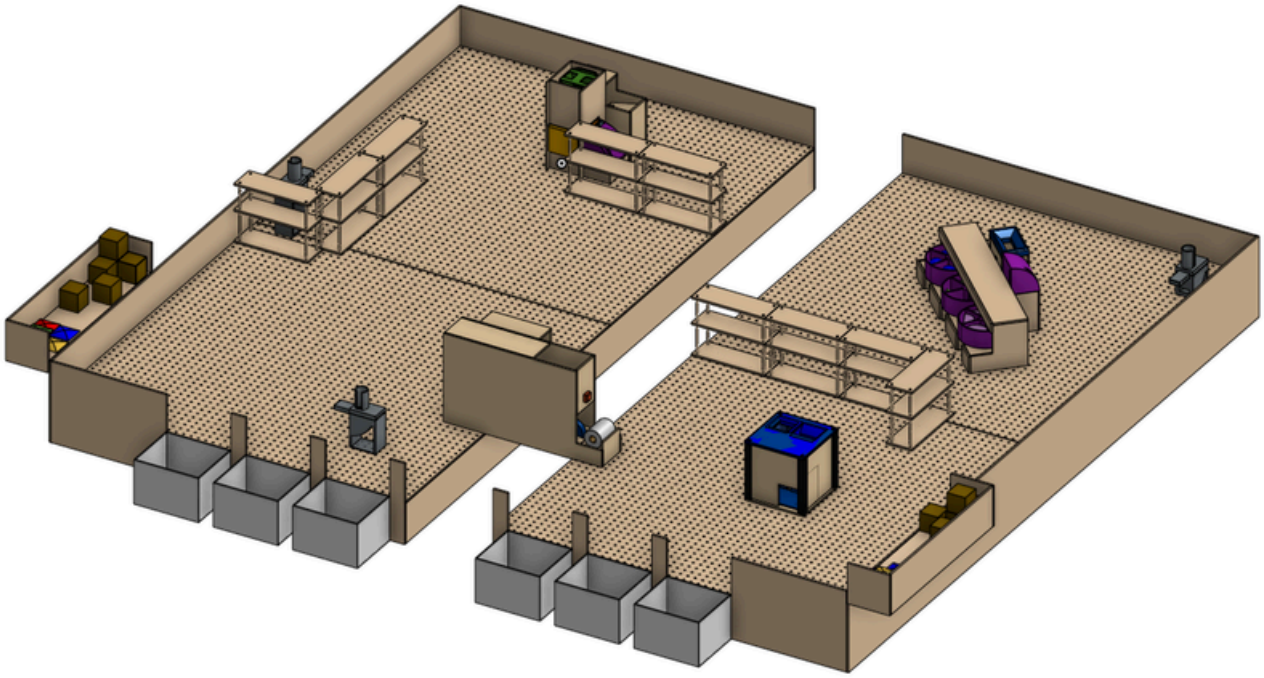


FIGURE 1: OVERVIEW OF THE FIELD

***** This is not the final layout of the field! *****

FIELD PRESENTATION

The field may be broken down as follows:

- The field is separated into two distinct sections of 4 by 8 feet.
- The river separating the two sides of the field is 1 foot wide.
- For each section of the field, there will be a Starting Zone, a Resource Zone (cardboard or plastic), and three single-colour Order Shipping Zones.
- In the complete field, there will be 4 distinct processing stations spread throughout: the paper machine, the furnace, the mixer, and the printer; as well as ink cartridge dispensers.
- Shelves are located at different location on the field. These can be used to facilitate the handling of resources.

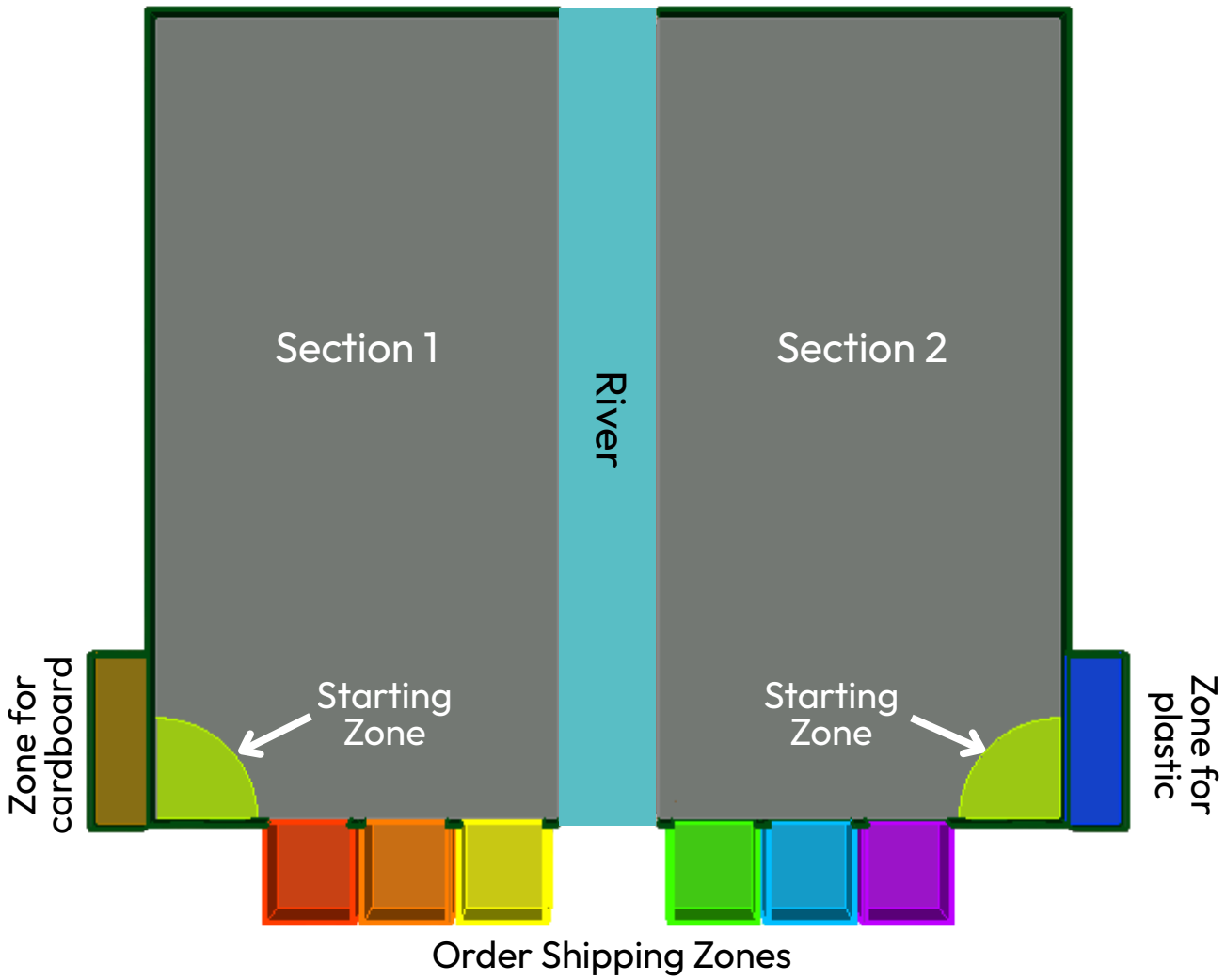


FIGURE 2: DIVISION OF ZONES ON THE FIELD

STATION LAYOUT

While transmitting information regarding the locations of stations on the field, some of that information was lost. The following are some guidelines on the possible layout of stations on the field:

- The stations are oriented and positioned to be accessible to a 1 × 1 × 1 ft robot.
- Initially, the cardboard bales are next to the Starting Zone of Section 1 and the plastic pouches next to that of Section 2.
- Each section contains one 3 in and one 6 in ink cartridge dispensers, placed at any location in the Section. Each dispenser contains the same number of cartridges.
- The paper machine is located across the river. On one side are the inlet slots for cardboard bales; on the other side are the activation button and the outlet for the paper rolls.
- There will be between 6 and 10 shelves placed throughout the field.

The red zones in the different figures below represent the zones in which each challenge element can be placed.

As soon as we have more information, we will let you know on the different communication channels. So stay tuned to not miss any information!

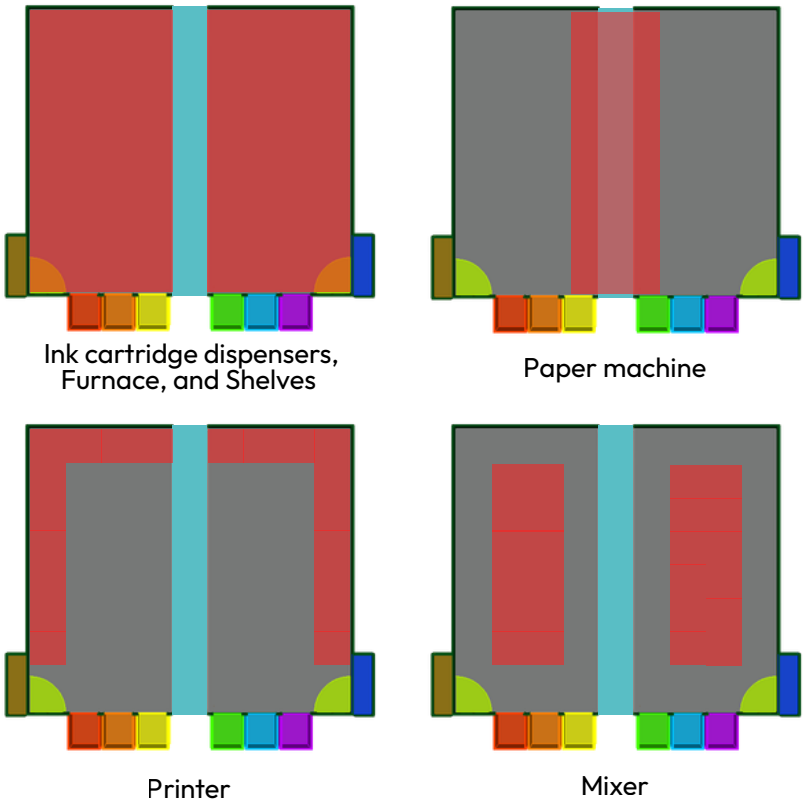


FIGURE 3: POSSIBLE LOCATION OF CHALLENGE ELEMENTS

2. CHALLENGE ELEMENTS

2.1. RESOURCES

2.1.1. CARDBOARD BALE

- Recycled cardboard is an essential input from RecycloBot's plants. This cardboard can be shredded and processed to create new products.
- The bales are made from recycled cardboard. It is therefore possible that the bales have some irregularities in their dimensions.
- Certain bales may contain metal. These should not be placed in the paper machine for the risk of breaking it. Each team will receive a copy of the two types of cardboard bales so you can tell them apart.
- **Dimensions: 2 x 2 x 2 in with ± 1/4 in of uncertainty**

2.1.2. PLASTIC POUCH

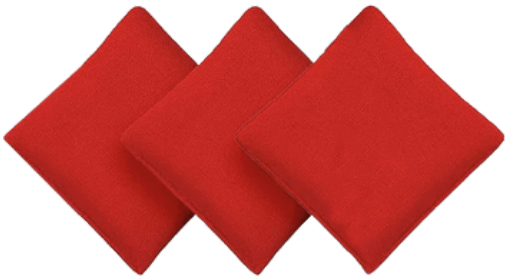
- Recycled plastic is another essential resource for the creation of RecycloBot products. This resource can be melted and molded into a new good. The colour of the bags containing the plastic is not important for the challenge.
- **Dimensions: 2 ¾ x 2 ¾ x ¾ in**

2.1.3. COLOUR INK CARTRIDGE

- In order to create colourful products and packaging, it is essential to have the resources necessary for colouring. Ink cartridges are therefore used for this purpose. There will be 3 cartridge colours only identifiable by an NFC tag: red, blue, and green. In total, there will be 36 coloured cartridges available throughout the field (12 ink cartridges of each colour).
- **Dimensions (Diameter x Height): 1 ¼ x ¼ in**



CARDBOARD BALE



PLASTIC POUCH



INK CARTRIDGE

FIGURE 4: THE ESSENTIAL RESOURCES

2.2. PROCESSING

2.2.1. PAPER MACHINE

- This processing station makes it possible to intake recycled cardboard and transform it into a reusable roll of paper. Be careful not to put a bale with metal inside! This could break the machine and cause production time delays (30 seconds).

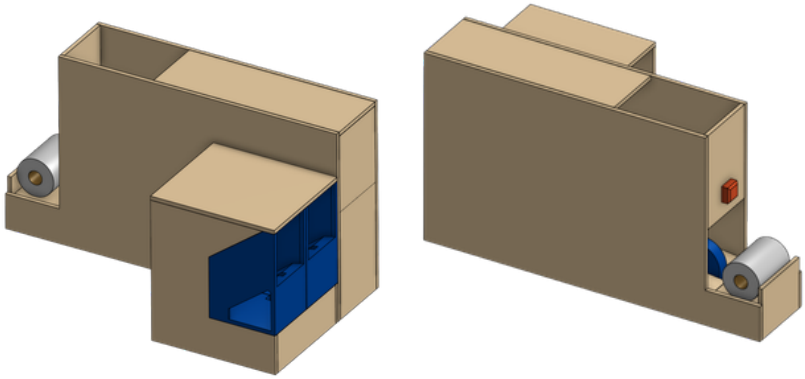


FIGURE 5: THE PAPER MACHINE

2.2.2. FURNACE

- This station uses cardboard bales as fuel to melt plastic pouches and mold reusable bottles. This station offers an opportunity to use the cardboard bales with metal inside.

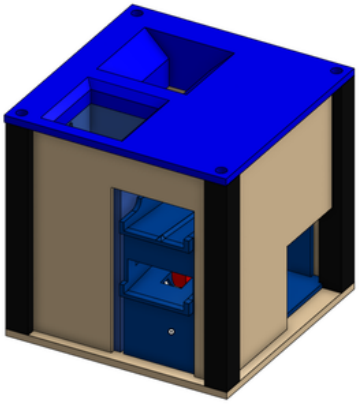


FIGURE 6: THE FURNACE

2.2.3. MIXER

- This machine intakes recycled plastic, mixes it with colour ink, and then makes various products according to the mixture colour. 3 products may come out: red cones, blue spheres, and green half-cylinders.

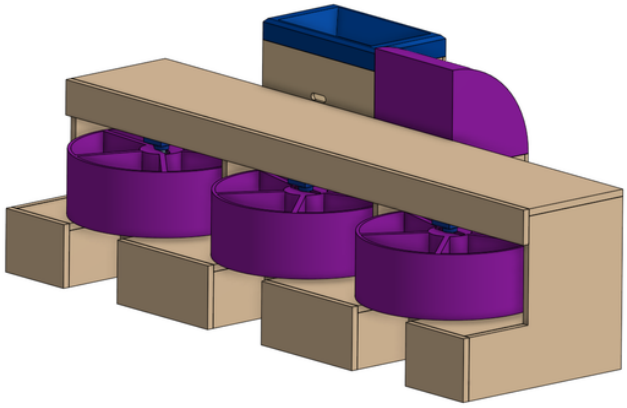


FIGURE 7: THE MIXER

2.2.4. PRINTER

- The printer reuses the paper rolls from the paper machine to produce printed cardboard packaging by combining a roll of paper with the three colours of ink cartridges.

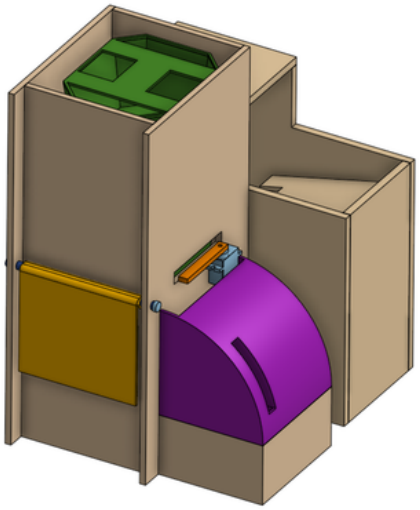


FIGURE 8: THE PRINTER

2.3. PRODUCTS

As presented, the various processing stations will allow you to create the following products.

2.3.1. ROLL OF PAPER

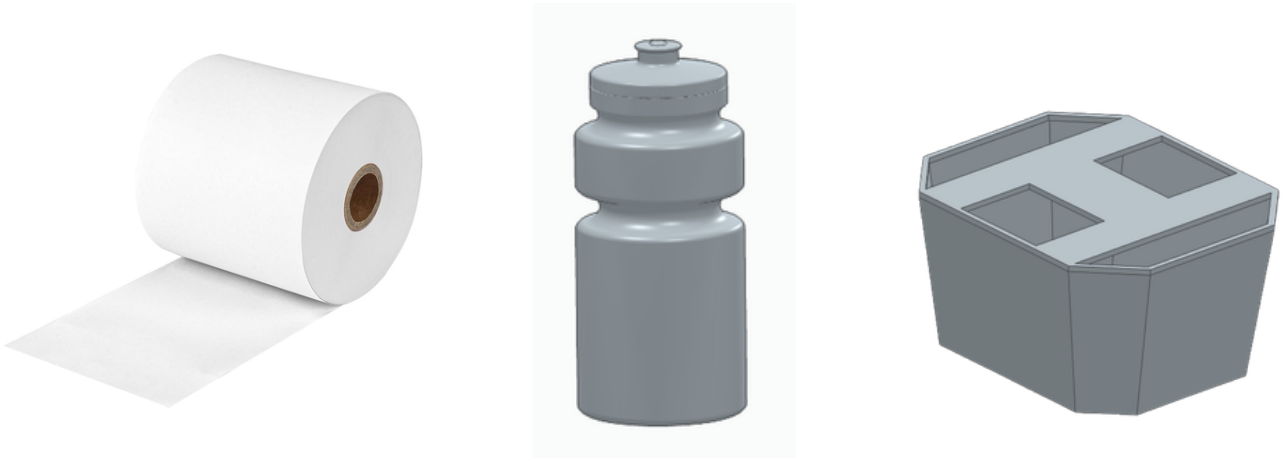
- Created by supplying recycled cardboard to the paper machine.
- **Dimensions (External diameter x Height x Internal diameter): 3 ¼ x 2 ⅜ x 1 in**

2.3.2. BOUTEILLE DE PLASTIQUE

- Supplying plastic and cardboard to the furnace will enable you to create a bottle and its label.
- **Dimensions (Diameter x Height): 1 x 2 ¼ in**

2.3.3. PRINTED PACKAGING

- Created from a roll of paper from the paper machine and the three available colours.
- **Dimensions: 4 ½ x 2 ¾ x 2 ½ in**



ROLL OF PAPER | PLASTIC BOTTLE | PRINTED PACKAGING

FIGURE 9: THE FINAL PRODUCTS (PART 1)

2.3.4. COLOURED SOLID

- Different solid shapes can be created using the mixer. Each of these is a specific colour. For all these solids, the inputs are a plastic pouch and a colour cartridge corresponding to the desired solid.

CONE

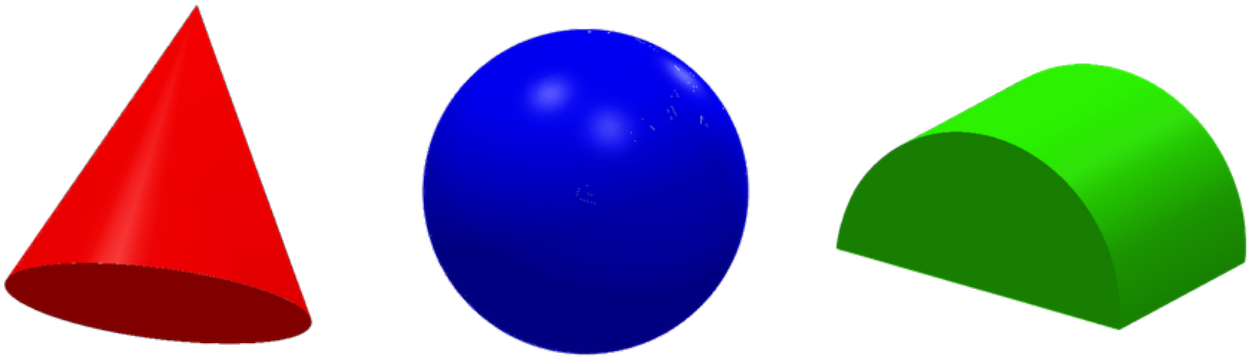
- Molded with plastic mixed with red ink.
- **Dimensions (Diameter x Height): 2 x 2 in**

SPHERE

- Molded with plastic mixed with blue ink.
- **Dimensions (Diameter): 2 in**

SEMI-CYLINDER

- Molded with plastic mixed with green ink.
- **Dimensions (Radius x Height): 1 x 2 in**



CONE SPHERE SEMI-CYLINDER

FIGURE 10: THE FINAL PRODUCTS (PART 2)

2.4. OTHERS

2.4.1. SHELVES

- Placed at different locations on the field, the shelves are used to store resources to facilitate their handling. Between 6 and 10 shelves will be distributed throughout the field.
- **Dimensions: 3 ½ x 10 x 8 in**

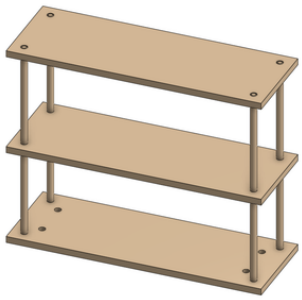


FIGURE 11: THE SHELVES

2.4.2. INK CARTRIDGE DISPENSERS

- Dispensers provide the necessary ink cartridges for the various stations. The same dispenser contains 9 cartridges of different colors randomly shared between the dispensers. There are two possible dispenser heights: 3 in or 6 in.
- **Dimensions (Height): 3 or 6 in**

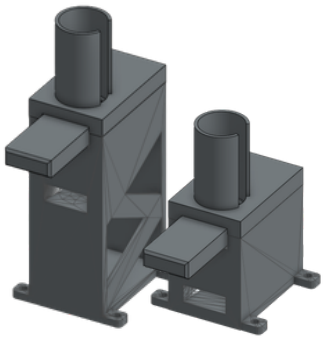


FIGURE 12: THE INK CARTRIDGE DISPENSERS

2.4.3. SHIPPING ZONES

- These bins are used to receive the products before they are shipped. They are placed on the ground, adjacent to the short side of the field and on the same side as the Starting Zones. A space of 1 ½ in separates each bin.
- **Dimensions: 8.7 x 7.6 x 6 in**

2.4.4. STARTING ZONES

- Each section of the field has a Starting Zone. The two zones are arranged symmetrically with respect to the center of the field and are shaped as a quarter of a cylinder.
- **Dimensions (Radius x Height): 12 x 12 in**

2.4.5. ZONE FOR CARDBOARD / ZONE FOR PLASTIC

- These two zones are placed on the long side of their respective section, adjacent to the Starting Zone. They are 3 ¾ in above the surface of the field.
- **Dimensions: 20 x 6 in**

2.4.6. THE RIVER

- The river corresponds to the space between the two sections of the field. It is too deep for a robot to rely on it as a foothold to cross. Any element that touches the river is considered as lost until the reset, including robots.

2.5. INPUT-OUTPUT DIAGRAM

The following diagram summarizes how resources are processed into products.

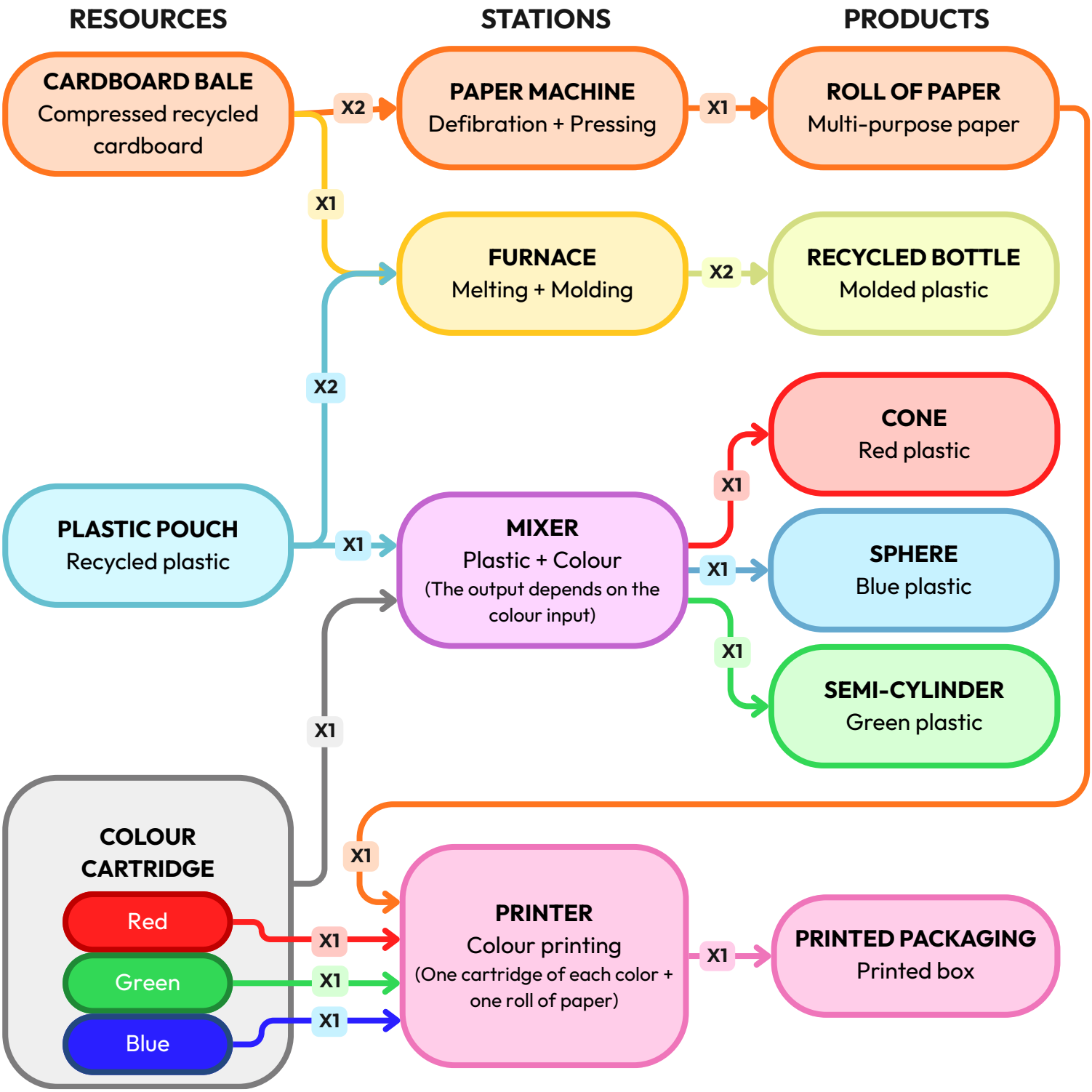


FIGURE 13: DIAGRAM OF THE CHALLENGE'S INPUTS/OUTPUTS

2.6. OPERATION OF PROCESSING STATIONS

In general, the principle is the same for each of the processing stations. In order to obtain a final product, the right resources must be input in the right places, with the right ratio to obtain the desired product.

IMPORTANT !

It is the responsibility of the teams to put the various resources in the right places on the different stations with the right ratios as to not cause malfunction of the stations. Any combination deemed not compliant based on the inputs or the ratios used will make the resources used as well as the product “Void”.

2.6.1. PAPER MACHINE

To activate the station, you simply have to insert two cardboard bales and then press on the station activation button. This sequence activates a mechanism to release a freshly created roll of paper. You only need to place one cardboard bale per compartment of the paper machine.

METAL DETECTION

Some bales of cardboard may contain metal and must not be passed through the paper machine as not to damage it. If a bale of cardboard containing metal is supplied to the paper machine, it will be deactivated for 30 seconds and the product will be considered “Void”. Regardless of the number of cardboard bales with metal used at the same time in the station, the latter remains unusable for 30 seconds.

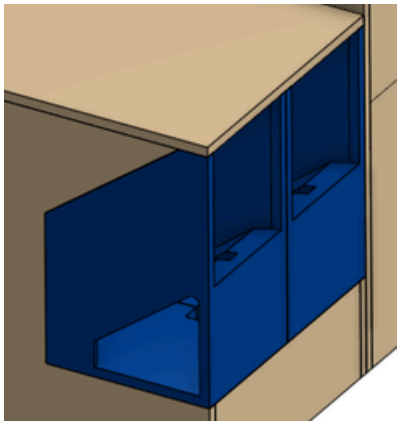


FIGURE 14: COMPARTMENTS FOR CARDBOARD BALES

2.6.2. FURNACE

There are two slots on top of this station. The slot in the shape of a square of 2 ½ in by 2 ½ in is dedicated to receiving cardboard bales, while the one in the shape of a rectangle of 1 ¼ in by 3 ¼ in is dedicated to plastic pouches.

To run the station properly, it is first necessary to place a cardboard bale in the station. Then, when a plastic pouch is inserted into the station, a bottle is released. A second bottle can be produced by inserting a second plastic pouch directly. It is then necessary to add a new bale in order to produce more bottles. In other words, bales act as loads that can be used twice with a plastic pouch to create a plastic bottle before being exhausted. There is a maximum of 4 cardboard bales that can be inserted into the station.

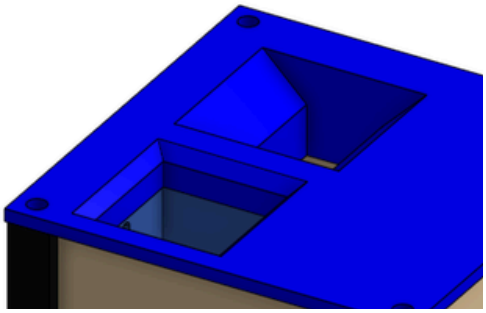


FIGURE 15: SLOTS FOR BALES AND POUCHES

2.6.3. MIXER

The colour cartridges are all the same, but contain an NFC chip that allows a sensor in the station to detect their colour. Combined with the insertion of recycled plastic, the mixer will provide you with the desired solid. In order to operate the station, the cartridge must first be inserted into the receiver for this purpose. Then, a pouch can be inserted into the slot for this purpose.

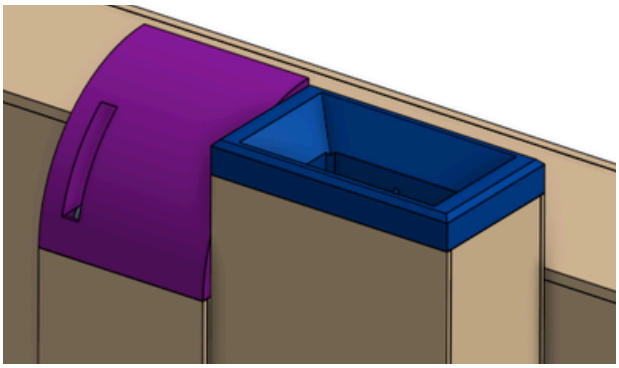


FIGURE 16: RECEIVERS FOR THE INK CARTRIDGES AND THE PLASTIC POUCHES

2.6.4. PRINTER

The printer uses the same principle to receive ink cartridges as the mixer. However, it is not programmed in the same way. When a cartridge is inserted into the station, it is scanned to obtain the colour of the cartridge deposited. Then, the colour of the cartridge is recorded in the station. Once there is a cartridge of each colour stored in the station, it is possible to insert a roll of paper into the station to receive the printed packaging. The colour memory in the station is erased after each use of the station.

IMPORTANT !

The goal of the challenge is not to “Cheat” stations, but rather to maintain the pace of orders that come. Therefore, for all stations, when a resource is inserted into a station, it will have to be consumed entirely in order to be valid.

Example: If a pouch is passed in front of a sensor several times to activate any of the stations, the action will be reprimanded by a penalty of 10% of the final points each time the pouch is passed.

Game referees and the organizing committee will have the freedom to decide whether or not an action is punishable by penalty.



2.7. SERVER

A server for the orders is provided to you and is the same that will be used during the final trial. For instance, it will enable the public to know which university is carrying out its trial and the time remaining.

2.7.1. SERVER INTERFACE

The interface presents the 6 orders available at the time. At the start of the trial, the orders arrive one after the other until the 6 are available. As the number of resources is physically limited, some orders may disappear when all the resources required to do so are consumed. There will be 36 orders possible with a maximum of 32 feasible orders due to the paper rolls that are reused for printed packaging. The various information displayed are the points earned, the necessary resources, the processing station used, the time remaining on the order, as well as the point multiplier of each order.

2.7.2. SERVER ACCESS

For your testing and preparation, a link to an executable version of the server will be transmitted to you through the various communication channels.

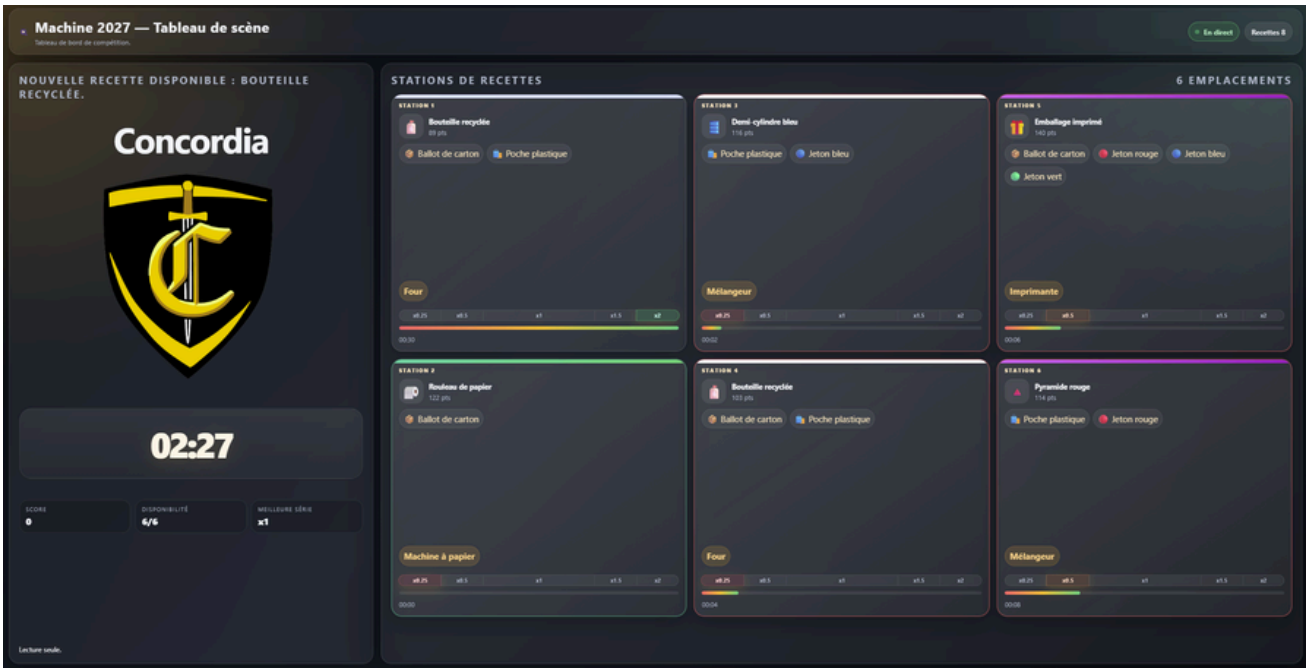


FIGURE 17: PARTICIPANT VIEW OF THE SERVER OF ORDERS

3. TRIAL PROCEDURE

3.1. BEFORE THE TRIAL

TEAM AND ROBOTIC SOLUTION PREPARATION

Teams must ensure that their robotic solution complies with the Machine Rulebook regulations and is ready to be deployed on the field. Any ongoing modification must be interrupted as soon as the team is called for their trial.

DIMENSION AND SAFETY VALIDATION

Before entering the playing field, the team's robotic solution will undergo a final validation of its dimensions by the judges. The robotic solution must fit entirely within each Starting Zone. The judges will also conduct a visual inspection to ensure that no part of the robotic solution poses a danger to the field or the operators.

PLACEMENT OF THE ROBOTIC SOLUTION

Once the validation is complete, the team will place each of their robots in their respective Starting Zone. A second validation will then be performed to confirm each robot is entirely within its Starting Zone, without any part of the robot sticking out when observing from a bird's-eye view.



3.2. DURING THE TRIAL

START OF THE TRIAL

At the judges' signal, the trial timer begins. The robot may then start its operations. Each team will have 7 minutes to complete their trial.

ENTRY AND DURATION OF ORDERS

At the start of the trial, an order will already be displayed on the screen: either a roll of paper or a recycled bottle. After that, a new order will appear every 10 seconds until all slots are filled. Teams will have 30 seconds to complete an order before it is removed and replaced with a new one.

HUMAN INTERVENTION AND RESET

If the robot becomes stuck, leaves the field, or requires manual intervention, the team may request a reset. Each reset will result in a penalty applied to the score accumulated at the time of the intervention.

COMMUNICATION AND CONTROL

Each team will be allowed a maximum of two pilots. These pilots will only be able to communicate with the robotic solution wirelessly.

3.3. AFTER THE TRIAL

END OF THE TRIAL

The challenge can end in one of four ways: time runs out, a team performs a prohibited move, the team decides to end the challenge early, or all the orders are completed.



3.4. TEAM POSITIONING

Throughout the entire trial, team members present on stage must remain within the designated zones shown in the figure below. Repeated violations of this rule by one or more team members will result in a penalty equivalent to a reset, representing 15% of the trial score. The different zones are defined as follows:

3.4.1. PILOTING ZONE

- To allow judges and spectators to clearly observe the trials, drivers and assistants may move freely only within the Piloting Zone.

3.4.2. RESTRICTED ZONE

- The Restricted Zone is an extension of the Piloting Zone. However, any person within this zone must crouch to move around.

3.4.3. PROHIBITED ZONE

- The Prohibited Zone faces the public and is inaccessible to all.

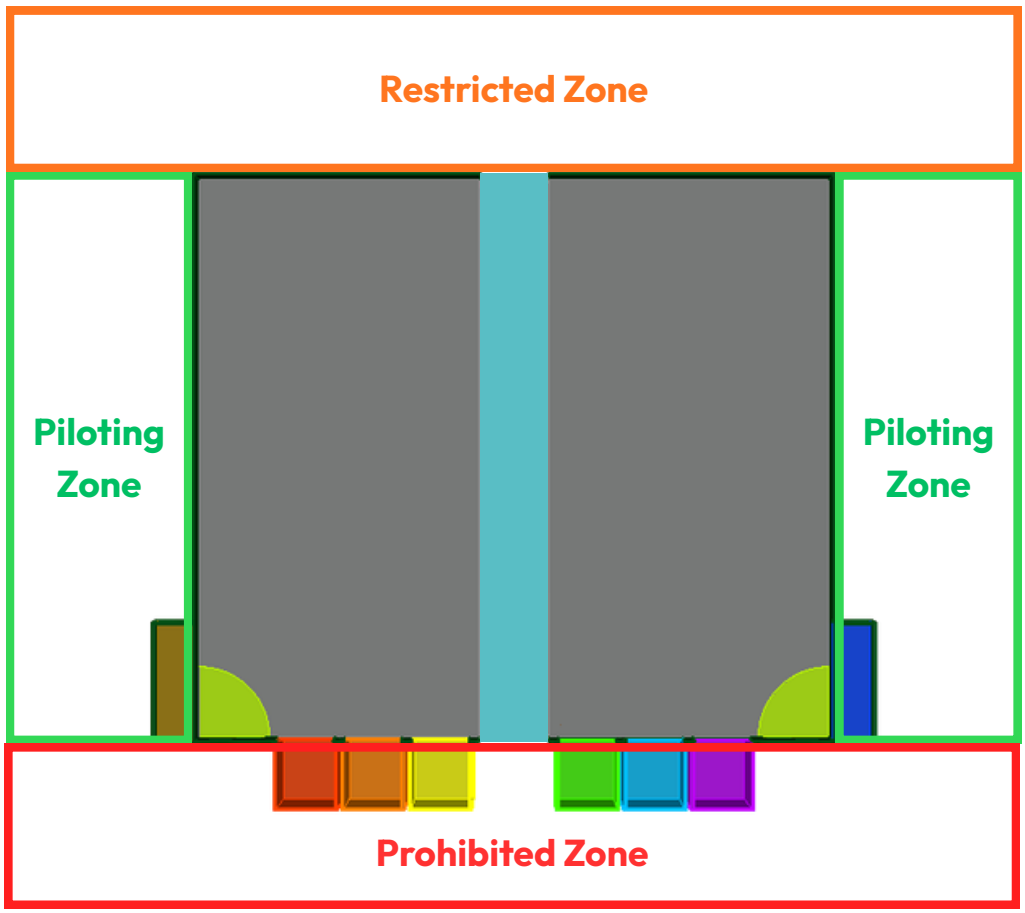


FIGURE 18: PILOTING ZONE LAYOUT DURING THE TRIAL

3.5. REGULATIONS

ROBOTIC SOLUTION

- The robotic solution can comprise only 2 robots. A robot is a whole: at all times all its components must be connected and move with it.

CONTROL VOLUME

- Each of the robots will have to be able to enter entirely into a zone in the shape of a quarter cylinder with a radius of 12 in and a height of 12 in. A personalized box in the dimensions of the Starting Zone will be fabricated to test the dimensions of each of the robots.

PREPARATION

- At the start of the trial, both robots will have to be placed in their respective Starting Zones and the robot size check will be carried out. It is prohibited to interact with the solution once the verification has been carried out.

TRIAL DURATION

- The teams will have 7 minutes to complete their trial.

INTERRUPTION DURING THE TRIAL

- The members of the organizing committee reserve the right to stop the trial for reasons which include, but are not limited to: damage to the field or resources, external interference, or technical problem. In the event of an interruption, the team must stop piloting their solution, the time will be stopped and measures will be put in place to either resume the trial, restart it, or stop it.

INTEGRITY OF THE SOLUTION

- The solution shall not leave any detached part or component behind during the trial. In the event that a part breaks during the trial, if the part left behind is considered harmful to the trial by a member of the organization, the solution shall be reset. During reset, the part can be repaired or sidelined. The trial time will not be paused.

ANIMALS

- No animals are allowed to be part of the robotic solution.

SECURITY OF THE SOLUTION

- The solution must not pose any danger to the public, participants, and other robots. The use of explosives, fire, or any other dangerous material is strictly prohibited. For the same reason, flying solutions are not allowed. If in doubt, contact the organizing committee.

COMMUNICATION SYSTEM

- The communication system used to communicate with your robots must consist of 1 or 2 control systems (one per robot). Each of the control systems must be wireless and in direct communication with their respective robot. There are no weight or size restrictions. However, each control system must be easily transportable, battery-powered, and comply with the same safety standards of the robotic solution. Screens on control systems are prohibited.

INTEGRITY OF THE FIELD AND RESOURCES

- It is prohibited to damage or dirty the course and resources. More precisely, a robotic solution must in no way leave materials, residues, or any other element that could compromise the quality and integrity of the field and its resources.

NO CONTACT WITH THE FIELD

- During the trial, no member of the team is allowed to touch the field. A team touching a part of the field without permission will have to reset their robotic solution without stopping their trial time.

CONTROL OF A RESOURCE OR PRODUCT

- A robot can only handle one resource at a time during the trial. “Control a resource” includes any direct or indirect action on it (push, pull, lift, transport, or move).
- The same applies to products.

OBSTRUCTION BY A RESOURCE OR PRODUCT

- If another resource blocks its trajectory, the robot can move it only to free its passage. It is prohibited to move a resource intentionally and strategically in order to gain a competitive advantage.
- Referees and members of the organizing committee will have the freedom to judge that a second resource has been intentionally moved in order to obtain an advantage. This will be considered as a foul and a penalty will be applied.
- The same applies to products.

REPAIR DURING THE TRIAL

- If a team has to repair its solution during a trial, they must do a reset and may take the time they needs to repair its solution. Repairs must be carried out outside the playing field or in the Starting Zone and only manual repairs not requiring any tools are accepted. Also, no new code can be sent to the solution. Trial time continues to run throughout this procedure.

SOLUTION RESET

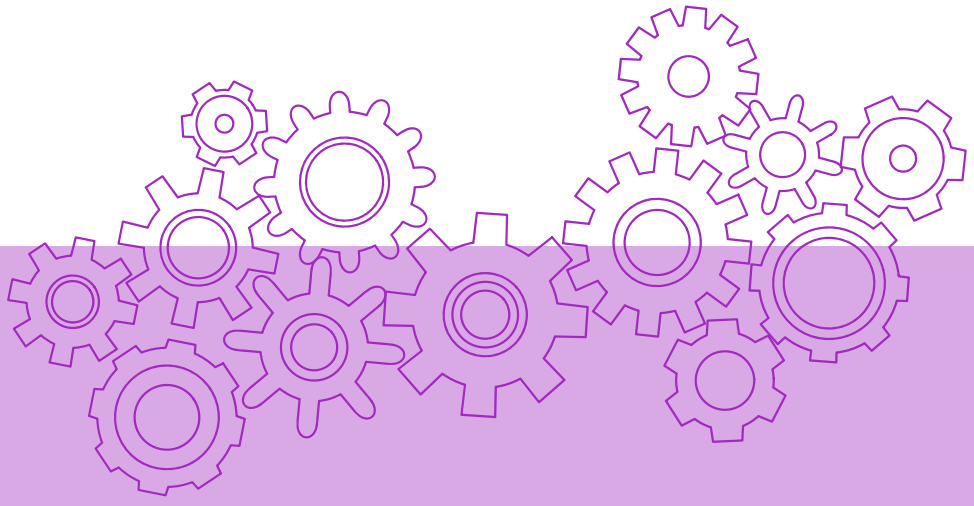
- Resetting the robotic solution must be done by the following steps:
  - 1. Request and wait for the approval of a member of the organization to reset
  - 2. If applicable, give all the resources or products under control by all the robots in the solution to a member of the organization. The resources are put back to the area or station they were taken from.
  - 3. Take the solution and place it in accordance with "PLACEMENT OF THE ROBOTIC SOLUTION" in Section 3.1.
  - 4. Wait for validation of the dimensions by one of the referees.
  - 5. Resume piloting the robotic solution.
- Resources and products that have fallen into the river are returned to their initial positions (respective Resource Zone or station).

VOID

- Any resource or product considered as “Void” becomes unusable to make products and is no longer worth any point.

SABOTAGE PROHIBITED

- It is strictly forbidden to sabotage, interfere with, or intentionally disrupt another team’s run, by any means whatsoever. Any team found responsible for sabotage will receive 0 points for their entire run.



4. LOGISTICS

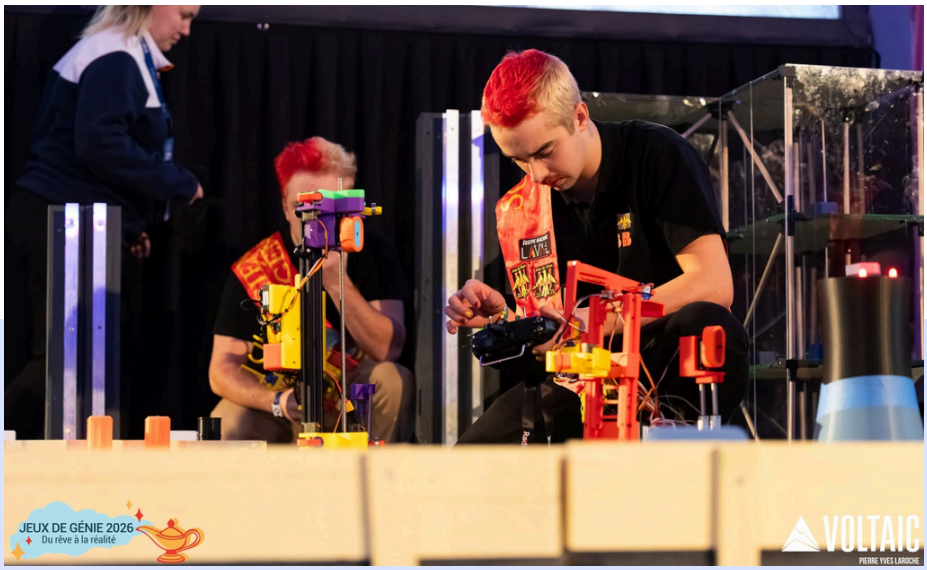
4.1. MACHINE PERIODS

The final schedule of periods will be revealed with the full schedule of the Engineering Games. It will be similar to previous years. During these periods, a maximum of 4 representatives of each delegation may be present. For logistical reasons, the periods will take place outside the hotel in a room at Université Laval.

4.2. FINAL TRIAL

The logistics of the preparatory trials on the official course and the presentation before the judges during the competition day will be revealed to the teams during the Engineering Games.
Five members of the delegation will be able to be present on stage:

- **2 Pilots**
  - The Pilots are the only person authorized to use the control system. The rest of the team can under no circumstances interact with the control system, but can assist when initialising and resetting the solution.
- **2 Assistants**
  - The Assistants help direct the Pilots and communicate between the piloting team members.
- **1 Emcee-Helper** to entertain the public with the Emcee from the CO.
  - The Emcee-Helper does not need to be part of the Machine team, but must be familiar with their delegation's Machine.



5. SCORING OF THE TRIAL

The points awarded for **successful orders** of each type are as follows:

ORDERS	POINTS
Roll of paper	5
Recycled bottle	5
Cone	10
Semi-cylinder	10
Sphere	10
Printed packaging	35

Point multipliers will be applied based on the time required to complete an order:

INTERVAL	MULTIPLIER
[0,3[	x1.5
[3,9[	x1.25
[9,21[	x1
[21,27[	x0.75
[27,30]	x0.5

Penalties will be applied as follows:

PENALTIES	POINTS
Reset	-15%/reset
Damage to the playing field	-20%/damage
Handling of several resources at once	-20%/handling

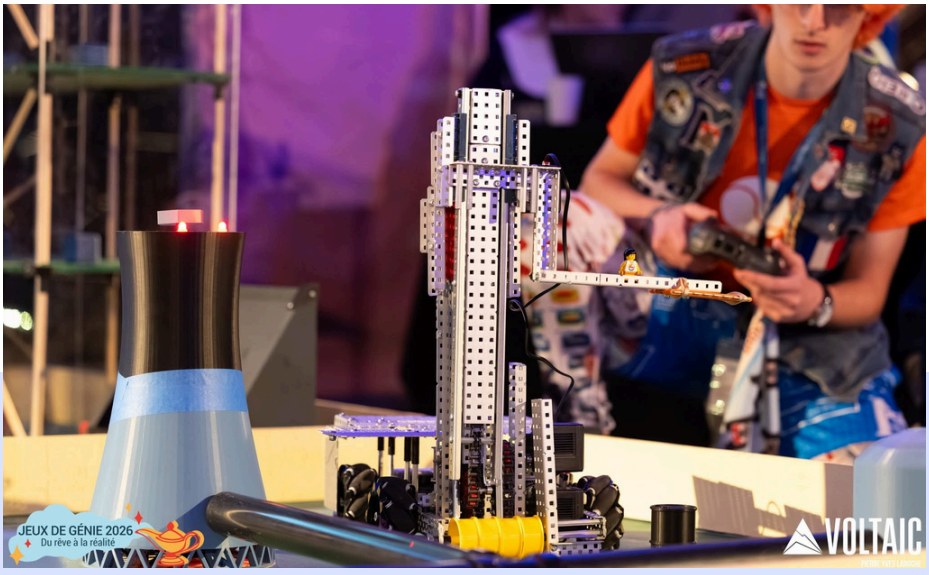
The equation for the **trial's score** is as follows:

$$Score = \left(\sum_{i=1}^{n} P_i \times M(t_i) \right) \times (1 - 0.15R) \times (1 - 0.20B) \times (1 - 0.20N)$$

Where:

- i = Order completed
- P = Points of the order completed i
- M = Multiplier for the completion time of the order i
- R = Number of resets
- B = Number of damages to the playing field
- N = Number of foul plays for handling several resources

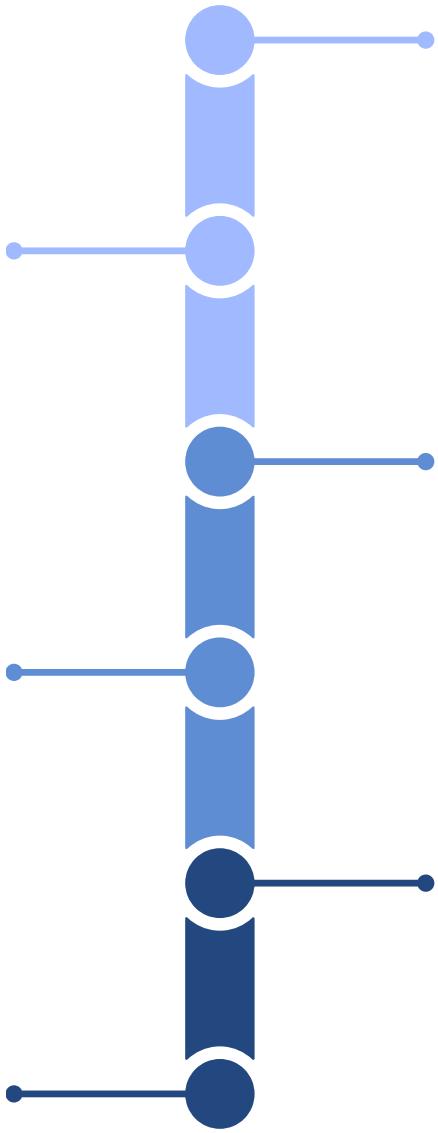
Adjusted final score = (Team score / Best team's score) × 60



6. DELIVERABLES

6.1. TIMELINE

The important dates are presented in the following timeline:



FIRST WEEK OF SEPTEMBER
Invitation of participants to the different information channels

SEPTEMBRE 5TH 2026
Release of the Machine Rulebook and the Construction Booklet

NOVEMBER 6TH 2026
Submission of the preliminary progress report

NOVEMBER 13TH 2026
Comments on the preliminary report

NOVEMBER 27TH 2026
Submission of the final progress report

JANUARY 1st 2027
Submission of the presentation video and of the visual aid for the oral presentation

JANUARY 3RD TO 7TH 2027
Engineering Games

6.2. EVALUATIONS

The weight of each evaluation is presented in the following table:

EVALUATIONS	**WEIGHTING**	**NAME OF THE SUBMISSION FILE** (replace uni by the name of your university)
Progress report	10%	rapport_prelim_uni.pdf rapport_final_uni.pdf
Presentation video	5%	video_machine_uni.mp4
Presentation before judges	25%	presentation_machine_uni
Official trial	60%	
Total	**100%**	

6.3. PROGRESS REPORT

The purpose of the progress report is to present to the organizing committee your understanding of the challenge and the progress on your robotic solution. Only the final submission is evaluated, but a team submitting only the final report without submitting the preliminary report will not be evaluated and will receive a 0.

The report aims to be concise and to present the current version of your solution, omitting the different iterations.

The report must be **maximum 12 pages** long, including the cover page and table of contents, but excluding the appendices. The appendices may, for example, contain additional figures, but the information in the appendices must not be necessary for understanding the report.

The following table presents the evalution criteria that will be used when assessing your report. The order of presentation may be different, but we must find all these elements and in a logical structure that helps the reader.

EVALUATION CRITERIA	POINTS
Structure and clarity	1
Strategies, approaches, and proposed solutions	2
Summary presentation of the solution	3
Presentation of the expected results	2
Risk management process	2
Bonus: Complete CAD of the solution	1
Total	**10**

6.3.1. STRUCTURE AND CLARITY

Two main criteria will be evaluated:

- Language quality (syntax and spelling): technical and appropriate language, good syntax.
- Presentation of the report: logical structure and aspects to help with the flow and the understanding of the elements presented (title page, table of contents page, figures and tables that are clear and referenced in text, etc.)

6.3.2. STRATEGIES, APPROACHES, AND PROPOSED SOLUTIONS

Present your overall design strategy, explaining how you think you will succeed in this challenge and briefly discuss the unimplemented solutions that you have thought about. You must also present the strategy and approach that will guide your trial.

6.3.3. SUMMARY PRESENTATION OF THE SOLUTION

This section must first present your solution as a whole and then dissect it into subsystems to present all its components. If the two robots are identical, you can present only one, and otherwise you can tell what is shared between the two robots and what differentiates them.

The following elements are necessary to properly present your entire solution:

- Render or sketch of the solution
- Presentation of the control system
- Presentation of the movement system
- Presentation of the collection system(s)
- Any other system giving you an advantage

Explain and justify your choices, the strengths of your systems, and the potential improvements.

6.3.4. PRESENTATION OF THE EXPECTED RESULTS

With the presentation of your strategy for the trial and the presentation of your robot, present your estimate of the points you are going to make. For example, you can estimate the runtime for an order and the number of each category of order you think you can do. Justify with the strengths/weaknesses of your solution.

6.3.5.RISK MANAGEMENT PROCESS

As the challenge is complex, the solution you are designing obviously carries risks to the success of the trial. Identify them and present a management plan. This section should include:

- The risks identified
- Analysis of the likelihood and the severity of these risks
- Mitigation plan: what you are going to do to reduce the likelihood or the severity of the risks
- Contingency plan: how to reduce impact if risks occur

6.3.6. BONUS: CAD OF THE SOLUTION

Teams submitting their partial or complete CAD can earn up to 1 additional point. CADs should not be essential for the understanding of the report and the bonus point cannot bring the full score of the progress report above 100%.

6.4. PRESENTATION VIDEO

The aim of the presentation video is to introduce the Machine team of your university and to present the solution as well as the strategy for the trial. It must last between 3 and 4 minutes and should be both entertaining and informative.

EVALUATION CRITERIA	WEIGHTING
Introduction of the team and their university	15%
Presentation of the Machine and its operation	30%
Simplification of content and accuracy of information	20%
Originality and alignment with the theme	20%
Quality of the video	15%
BONUS: Subtitles in the opposite language	**5%**
Total	**100%**

IMPORTANT !

The OC reserves the right to not broadcast a video deemed inappropriate and in this case to assign a score of 0/5. The video must be submitted in MP4 format before January 1st and any delay will result in a 50% loss of points. A video submitted after the 3rd machine period will receive a score of 0/5 and will not be broadcast during the competition.

6.4.1. BONUS: Subtitles in the opposite language

A bonus of up to 5% will be awarded to teams that add subtitles in the opposite language to their video. This bonus cannot increase the total score of the presentation video beyond 100% of the total points.

6.5. PRESENTATION BEFORE JUDGES

Each team will be required to present their solution before a panel of judges on the day of the competition before the official trial.

Each presentation will have a duration of 7 minutes with 3 minutes reserved for a question period. If the presentation takes less time, the question period may last longer in order to fill the 10 minutes, at the discretion of the judges. If the presentation is not completed after 6 minutes, a signal will be given to the team. If it is not finished after 7 minutes, it will be interrupted to begin the question period.

Each team is required to submit a .PDF version of their presentation, but if the team wishes to present a version with animations or special elements, it is also possible to share their presentation to the OC in Google Slides format only.



7. QUESTIONS

Any questions regarding the Machine Rulebook must be submitted via a Google Forms. The answers to all these questions will also be available in a Google Sheet. Both of these documents will be accessible via the Engineering Games website in the “Delegations Space” tab.

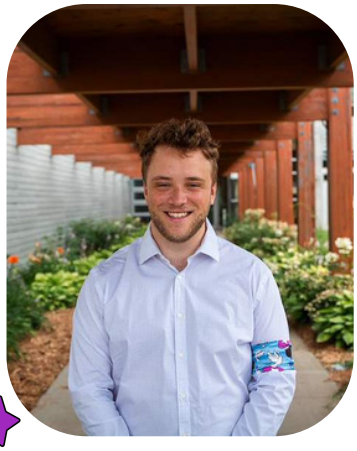
Anyone who submits a question through another communication channel will be directed to the Google Forms.

8. REGULATION CHANGES

The organizing committee reserves the right to make modifications to this rulebook. In the event of modifications, a new version of the rulebook will be available on the Engineering Games website, and the delegations will be notified. In the event of any discrepancy between the French and English versions, the French version will prevail.



9. ORGANIZING COMMITEE



Étienne Charbonneau
VP-Machine



Vincent Levesque
VP-Machine

Guillaume Malo
Machine Director

Julien Laurence-Brook
Machine Director

Leo Bertin
Machine Director

Dan Levy
Machine Director

If you have any questions or comments about the challenge, you can contact the Machine Team at the following address:

machine@jeuxdegenie.qc.ca