

# MAKERFIGHT's Ruleset

---

## 1 General rules

Makerfight's ruleset is voluntarily simple and is subject to updates if needed.

### 1.1 Introduction

1. **Safety first.** People's safety must be the first focus during any activity related to Makerfight.
2. **Be excellent to each other.** Mutual respect is necessary to the good running of the community, and we take it to heart. In case of doubt when it comes to solving a conflict, keep in mind why we are all members of this community, and try to solve the problems with a positive attitude.
3. **Don't make us create new rules.** No one enjoys booksize rulesets. Most rules exist because somebody once had a risky or inappropriate behavior, making the said rules unfortunately necessary. Don't be that somebody !

### 1.2 Participating to Makerfight

1. All participants build and use their robots at their own risks. All participants are responsible for their own safety and other's safety while designing, building and using their robots. The event organizer maintains a liability insurance for the event and encourages the participants to do the same.
2. It is expected from the participants that they follow Makerfight's ruleset on their own without constantly requiring reminders.
3. In case of doubt regarding a robot or a weapon not taken into account in the present ruleset, it is recommended to contact the event organizer prior to the event, in order to avoid a potentially disappointing non admission to participate from the organizer during the technical check.
4. Exploiting a loophole that may exist in this ruleset may put at risk the participants, the staff, or the audience, thus the organizer may disqualify a robot even before the beginning of the fights without necessarily having to justify their decision.

## 2 Safety

### 2.1 Locking bars

**Mandatory for active weapons.** The active weapons locking bars must ensure the moving parts of an active weapon cannot move even if activated. The locking bar must be a mechanical device. The capacity of the locking bars will be evaluated and tested in the arena if necessary. In case of doubt, the organizer may require the participant to increase the locking bar's capacity prior to the final technical check of the robot. Locking bars must be installed if the robot is not inside the arena. Outside the arena it is possible to remove it only if the source of energy has been disconnected and removed from the robot.

## 2.2 Electrical supply disconnection device

**Mandatory.** The electrical supply disconnection device must be easily accessible from the outside of the robot, without having to dismount any part. It must be located in a location which makes the switching of the electrical supply safe for the operator regarding the weapons.

When the electrical supply is connected, the robot can operate (the robot can move and the weapon can be activated). When the electrical supply is disconnected, the robot must not be able to operate. The device must be wired as close as possible to the battery, in order to fully disconnect the robot's power circuit. Ce système doit être placé au plus près de la batterie de façon à ouvrir ou fermer l'ensemble du circuit de puissance du robot. If several batteries are used in the robot, the device must disconnect each battery. The device can be a link or a switch. The device will be tested during the technical check.

## 2.3 Carrying and storage cradles

**A cradle is mandatory for carrying the robot, testing the robot, and overall whenever the robot is not in the arena.** The cradle must avoid contact between the locomotion means (wheels for example) and the surface the cradle is put on (floor, workbench, table ...). It must ensure stability at any stage of its use including the drive system testing.

## 2.4 Inappropriate behavior

A team may be disqualified in case of inappropriate behavior of one or several of its members, especially if repeated.

**A robot will automatically be disqualified if one of the above points is not respected.**

## 2.5 Implementation of the safety rules

When the robot is not inside the arena, the locking bars must be in place, the electrical supply disconnection device must be disconnecting the electrical supply, and the robot must be put on its cradle. For exceptions see chapter Pits.

Inside the arena, the roboteer can connect the electrical supply, and then the locking bars can be removed.

The robot must be on its cradle during any transportation during the event.

During the fights, if a robot does not respond to the controls, we will wait for the battery to be empty. If this takes more than 6 minutes, the organizer will use an entanglement net to stop the robot. The organizer is not responsible of any damage caused to the robot during these procedures.

It is recommended to implement a failsafe system which will stop the robot in case of radio transmission loss. The roboteer will have to let the organizer know that the robot is in failsafe.

It is expected from the participants that they follow common sense safety rules, such as wearing PPE when using power tools.

The use of welders, grinders and any other equipment that may cause sparks, fumes, arcs, debris or toxic substances is only allowed in dedicated areas. In case of doubt, don't decide, ask the event organizer.

## 3 Robots

### 3.1 Weight

The robot's weight must be 13.6Kg or under (*30 Lbs* "featherweight").

The scale used at event time will be the only reference used. If possible, the event organizer will have the scale certified prior to the event, or will have a weight reference item to check it the day of the event.

It is recommended to be able to easily remove weight in case there are differences between the scale used at the event and the one used to check the robot prior to the event.

The maximum weight must include all the components such as batteries, consumables, etc, as well as the link. The locking bars are not part of the weight of the robot.

If the robot has interchangeable parts (different setups), it will be weighted in its heavier setup.

In case of a multibot configuration, the weight considered will be the addition of the weights of all the robots. For example it is possible to have a 10Kg main robot and a 3.6Kg minibot.

### 3.2 Technical constraints

Every robots must be controlled by the driver(s) and must fulfill the following constraints :

- Wireless communication. The communication protocol is not imposed.
- No explosive, no flamme.
- Pneumatics : One tank of CO2 with maximum pressure of 68 bars is allowed, see specific annex.
- No liquid projections.
- Nothing alive.
- No projectiles.
- No entanglement devices. For example, nets, cables, or fabrics designed to entangle the weapon of the opponent are prohibited. The authorization of a specific or border line device will be decided during the technical check.
- No electrical discharge, EMP device, or system designed to disturb electronics or communications.

### 3.3 Multibots / Clusterbots / Minibots / Secondary Bot

It is possible to have more than one bot at the same time. Robots can be driven separately.

All the robots including the non main bot must comply with all the constraints written in the ruleset.

The addition of the weights of all the robots must be under 13.6Kg. For example it is possible to have a 8Kg main robot and a 5.6Kg secondary bot. The weight will be checked in the heaviest configuration.

A multibot configuration must be declared as a multibot configuration at the beginning of the event (during the technical check), and before each fight.

Each robot must be able to show control independently.

### **3.4 Approval of the robot & technical check**

Each robot engaged in Makerfight must pass a technical check before it can compete.

The technical check is based on a checklist (see annex). All the boxes must be checked in order for the robot to pass the check.

If a robot does not pass the technical check, the team can modify it in order to comply, and go through the technical check again.

All the safety features written in the ruleset will be checked.

As designers and builders, teams must inform the technical check staff about any potential risk associated with the robot, as well as explaining how the robot works.

In some cases, the technical check staff may decide it is necessary to limit the use of a robot (for example reduce the maximal speed of a weapon motor). It is the team's responsibility to ensure the restriction is applied at any given time, or the team will be disqualified.

If the robot has several interchangeable weapons, all the setups will need to be tested during the technical check. Only the setups shown at the time of the technical check will be allowed. It is not allowed to mix weapons and robots which haven't been checked simultaneously.

Repairs and minor modifications are allowed between fights. In case of heavier modification, the robot must pass the technical check again before the next fight.

The robot must overall be safe enough to be operated. The organizer may disqualify any robot if they think the robot is not safe enough.

Only the event organizer can allow a robot to compete.

## **4 Transmission and communications**

The robot must be controlled via a wireless system. The choice of the technology is free, however some rules must be followed :

1. The transmission can only be activated when the robot is inside the arena, in a test area decided by the organizer, or in the pits if all the safety rules are followed.
2. Radio communication systems must comply with applicable laws and restrictions, if a specific license is required for a given system, the team must inform the organizer, and provide the license if asked for.
3. It is not allowed to purposely cause interference with the opponent's transmission system.
4. It is recommended to use a system with emitter / receiver binding feature. If not, the frequency of the communication system must be changeable in order to avoid interferences.

## 5 The pits

A pit area is provided to each team, equipped with :

- 1 table
- 1 bench or chairs
- 1 electrical supply 230V / maxi 16A (bring an extension cord, and an adapter for French plugs if necessary)

The pit area is where the robots may be repaired, set up and tested by the teams, while following the safety rules written in the ruleset.

Every team can store their spare parts, tools and other materials necessary to fix their robots during the event.

Chargin the batteries can only be done in the pits, with an appropriate charger. It is also recommended to have a safety battery bag for charging and storing the batteries.

In the pits the robots may be powered on for tests as long as the weapon is not activated (locking bars must be in place). If the active part of the weapon is disconnected from the weapon motor, teh weapon motor may be tested as well (for example if the belt or chain is removed from the robot).

Only the participant team members and the organizer staff can access the pit area. For safety reasons the access will be checked by authorized staff members.

## 6 The arena

The arena is approximately 4 meters by 4 meters. It is flat and horizontal. Its floor is made out of 8 tables with 2mm thick steel on top and wood underneath attached together. Arena hazards may exist, and may be activated by the audience.

During the fights the arena is closed and no one can enter. When no fight is occurring, entering the arena is subject to authorisation of the current staff member responsible for the arena.

The arena is surrounded by an area delimited by barriers. This area is not allowed to the audience, only to participants and staff members.

The following items will be available close to the arena :

- A bucket filled with sand, a broom and a dustpan,
- Fireproof and cutproof gloves,
- A CO2 fire extinguisher,
- A fire blanket,
- An entanglement net or blanket.

## 7 The fight

The compatibility of transmission frequencies must be checked before the fight starts.

### 7.1 Number of rounds and duration of the fight

The fights are played by 2 winning rounds. Each round lasts 90 seconds. This duration may be modified by the event organizer in order to fit the all tournament into one weekend. It will be minimum 60 seconds and maximum 120 seconds. The duration will be decided at the beginning of the event and will not be modified afterwards.

### 7.2 Beginning of the fight

The robots will start the fight at opposite sides or corners of the arena. Normally the starting areas will be visually delimited, and will be away from the arena hazards.

Before the start countdown begins, the organizer may require the robots to prove ability to move, without attacking the opponent. A robot unable to move may be eliminated.

The fight starts after the end of the start countdown. During the countdown the robots must stay still, and the weapons can not be started. Failing to follow this rule will result in a false start, and if repeated to an elimination.

### 7.3 Judging criterias of a round

A robot losses a round in one or another of the following cases :

- ***It is unable to move.*** At any time the driver must be able to move the robot in a controlled manner if the referee ask them to. In this case it must be able to move on a significant distance (out of its own perimeter). After a first warning, if the robot does not move, the referee starts a 10 seconds countdown, after which the robot loses the round. The opponent is not allowed to attack during the countdown.
- ***The driver taps out.*** To tap out, alert verbally the judges and the opponent, and or tap the arena 3 times. The opponent must immediately cease to attack.
- ***The robot isn't safe anymore.*** : loss of control, fire, etc. The organizer (safety staff, judges, referees) may impose to cease the fight for safety reasons. This decision is not revocable and not arguable.
- The robot is ***disqualified*** for unfair or dangerous behavior.

After a round, if none of the previously listed losses occurred, the winner is decided by the judges.

The judges are part of the organizing staff. The judging team is made out of 3 persons. They must not be participants nor be affiliated to participants.

The commentator is also the referee. He is in charge of enforcing the rules during the fights (KO, countdowns, etc...). He will also check the active arena hazards are used in a non abusive way.

The winner is decided following the majority of judges decisions. The criterias used to decide the winner are :

- Damages inflicted to the opponent,
- The combative attitude of the robot,
- The control of the driver on its robot.

#### **7.4 Elimination**

Once a robot, or a robot part of multibot (see Multibots / Clusterbots / Minibots / Secondary Bot) is considered as eliminated, it must cease all movements (including weapons), and can not take an active part in the fight. Failing to follow this rule may be considered unfair play, and result in an elimination.

#### **7.5 Blockage / pinning of the opponent**

It is not allowed to block / pin an opponent for more than 10 seconds, for example if a robot pins its opponent against the arena wall or if it make the opponent impossible to self right, it must cease to block after maximum 10 seconds. The referee will ask to "Release" after 10 seconds. The blocking robot must back up and give a fair chance to its opponent to get back in the fight. Purposely and repetitively pinning an opponent will not give a win but may only get you points.

A robot which grabs or moves the opponent around must release after a maximum of 30 seconds.

If 2 robots are locked together and are unable to separate, the referee may pause the fight to separate the robots.

#### **7.6 Multibots / Clusterbots / Minibots / Secondary Bot**

In case a robot is made out of several robots, the robot is considered eliminated when 67% of the total weight is eliminated. It is important the referee and the judges know the weight of each robot before the fight. The robots may have different weights, as long as the total is not more than 13.6Kg.

#### **7.7 End of a round**

At the end of a round, when the time is out, a specific sound will occur, marking the end of the round. Robots must cease to move or attack. Damages inflicted after the end of the round will not count and may be considered unfair play.

#### **7.8 Pauses**

For technical reasons (robots locked together, etc ...), or for safety reasons, judges and referees can pause the round. The timer will be stopped but not reset.

If there is less than 30 seconds left on the timer or if the round has been paused for more than 5 minutes, the round may be judged without resuming the round.

## **7.9 Behaviour and fair play**

The judges, referees and organizers can eliminate (for a round or for a fight), or even disqualify a robot for unfair play, bad behavior noticed inside or outside the arena, or for not following the safety rules.

## **7.10 Decision**

Normally the judges decision is final. In case of a dispute, a team who disagrees with the judges decision can ask for clarification or explanation, but at the end of the exchange, the final decision is non-revocable.

Repeatedly and abusively contesting the judges decision may result in the disqualification of the team for the rest of the event.

To avoid any mistake, it is recommended that the winning team checks the result records matches the judges decision.

In case a team needs to repair a robot between 2 rounds, a 5 minutes time is allowed, inside the arena. If the robot can not restart, it loses the round and potentially the fight. The team will be allowed to repair the robot in the pits for its next fight.

A team can request to postpone a fight once if it needs more time to repair after a previous fight. If, when called for the second time, the robot can not compete, he loses the fight (but is not disqualified). If the team manages to repair for the following fight, the robot gets back in the competition.

# **8 The two phases of the competition**

## **8.1 Qualification phase (groups)**

The number of groups will be decided by the organizer depending on the number of registered and showing up robots. The teams will be put into groups which will have, as much as possible, the same number of robots. The group that a team will be assigned to is taken randomly.

If one team has several robots in the competition, the team will be able to ask the group assignment to be redone if more than one of their robots ends up in the same group.

The way the points are taken into account to decide which robot goes into the next phase will be given in annex.



## 8.2 Direct elimination phase

After the end of the qualification phase, the 2 best robots of each group are selected and go into a direct elimination phase. At each step, the loser is eliminated from the competition and the winner goes on to the next step.

After the semi finals, the 2 last losers will fight in the “petite finale” for the 3rd place on the podium, and the 2 winners will fight in the finale.

## 9 The team

Each team can be composed of up to 5 persons. It is possible to change drivers between 2 rounds but not during a round.

If there are several robots, there can be several drivers.

There can also be several drivers for the same robot, for example one for the driving itself and one for the weapon.

## 10 Ruleset

This ruleset can also be found on the Makeright dedicated website :

<https://www.makerfight.fr/reglement-makerfight/>

## 11 Contact informations

**MAKERFIGHT** is organized by the association **TECHNISTUB** which manages a Fablab & Makerspace in Mulhouse, France.

Generally, informations about the event and its organization will be regularly posted on Technistub's and / or Makerfight's channels :

- Website : <http://www.technistub.org> or <http://www.makerfight.fr/>
- Facebook : <https://www.facebook.com/technistub/> and <https://www.facebook.com/makerfight.mulhouse/>
- Twitter : <https://twitter.com/Technistub> et <https://twitter.com/makerfight68>
- Instagram : <https://www.instagram.com/technistub/> et <https://www.instagram.com/makerfight/>

The address of the association is :

Association Technistub  
2 rue des Flandres  
Bât. 5.06  
68100 Mulhouse  
FRANCE

An access map is available [here](#).

N.B. : the MAKERFIGHT event does not take place at the Technistub location but in a location rented for the occasion.

Any question related to the ruleset can be sent to the organizer via the [website contact form](#) or by email to [contact@makerfight.fr](mailto:contact@makerfight.fr).

## **12 Annexes**

**12.1 Pneumatic systems : per current Fighting Robots Association built rules, section 9, Pneumatics.**

**12.2 Example of score card**

**12.3 Calculation of points within the groups**

**12.4 Assignment of the robots in the groups and competition follow up**

**12.5 Technical check checklist**