ROBOT DESIGN RULES

KSU Combat Robotics Plastic 3 lb

WEIGHT CLASS

The weight limit is 3 lb.
If you are using a nontraditional motion bonus outlined below, then the weight limit increases to a max of 4.5 lb.

NONTRADITIONAL MOTION BONUS

Any robot that falls outside the definition of a “Traditional Motion System” qualifies for the Non-Traditional Motion Bonus. We classify Traditional Motion Systems as a robot that relies on the rotational motion of a component in contact with the ground as its method of locomotion around the arena. This includes all forms of wheels (round, non-circular, spoked, or offset axis) as well as continuous tread, track, or belt-driven systems. This also includes any robot that uses unpowered rotating objects (wheels, drums, rollers, ball bearings, etc.) as a means of friction reduction with the ground.

MULTIBOT CONFIGURATION

You are allowed to compete with as many robots as you wish to enter as one robot entry. However, there is no bonus for having a multibot configuration and all robots' weight added together must be below the listed weight limit. If you are using a “Non-Traditional Motion Bonus”, then all robots in the multi-bot configuration must abide by the outlined rules above. To count as a knockout, 51% of the total weight must be knocked out. For example, if you face an opponent with 2 identical 0.75lb robots then both must be knocked out to count as a win by knockout. All robots in a multibot configuration must meet all safety guidelines.

BATTERIES AND POWER

Bots must have an easily accessible master power cutoff in the form of a switch or removable link. The power cutoff must be accessible without disassembling the robot in any way. The power cutoff must be able to be deactivated in no more than 15 seconds. Maximum of 4s lipo (14.2 V nominal) or equivalent.

SAFE CHARGING PRACTICES:

- Inspect batteries for damage or puffiness before charging.
- Somebody must be present while a battery is charging.
- Balance charge leads must be used for any OTS battery that has them.
- Keep a sand bucket or liposafe bag nearby.

- Set an appropriate charge rate based on your battery.

ROBOT CONTROL SYSTEMS

Robot controls and communication systems must pass a failsafe test. In the event of signal loss or transmitter power-down, the bot's drive system must stop within 30 seconds and weapons must come to a complete stop within 60 seconds. All robots and multibots must have a dedicated receiver(s). Autonomously controlled robots are allowed, but they must still retain a radio control module that can remotely activate and deactivate the robot.

WEAPON LOCKS

All weapon systems must have a lock that stops their actuation, extension, expansion, rotation, etc. Weapons that move or rotate must have a lock or be constrained such that movement is restricted in all directions. Weapon locks do not count toward the weight limit.

DESIGN RESTRICTIONS

- Entanglement devices are not permitted. An entanglement device is defined as a component, subsystem, or armor configuration that is designed to be entangled in the rotational or moving parts of an opponent.
- Liquids are not permitted.
- Electrical and shock weapons such as tasers and cattle prods are not permitted. Weapons that primarily act by obstructing visibility are not permitted.
- Signal jamming devices or systems which interfere with communication between a robot and its controller are not allowed. Any weapon that directly targets or that may result in harm to those outside the cage is not permitted. This includes, but is not limited to lasers, high luminosity or strobing lights, or excessively loud noises.
- No flame or heat-based weapons.

MATERIAL SELECTION

The purpose of the plastic class is to allow an easier entry point for those who may not have access to a full shop or just want to try something different.

In general, all the normal bot design rules apply to plastic class bots except the construction materials must be plastic as described below:

- PET, PETG, PLA, & PLA variants, excluding PLA Flex, are the only materials that can be used for the chassis, armor, and weapons; no other types of plastics or

materials allowed (ie. metal, carbon fiber, UHMW, Tegris, etc). Other 3d printable materials are usable for motor mounts, tires, and other nonstructural components within the chassis.
- Motors, electronics, axles, fasteners, and adhesives can be any material, but cannot be used in such a way to enhance the structural integrity, armor the robot, or enhance any weapon.

Robots may be disqualified at the Event Organizer's discretion if it is deemed to violate the spirit of the class. Contact the event organizer ahead of time if you are not sure your robot meets the above definition.

THE SPIRIT OF THE COMPETITION

Have a unique, groundbreaking, wacky, or super-secret design that isn't covered by the rules? We love creative and fun designs that push the boundaries of what can be done in combat robotics. If you are unsure if your robot design qualifies, please contact us. Event Organizers, Safety Inspectors, or Head Referees may disqualify any robot that has been designed in such a way that skirts or violates the spirit of the competition, whether intentionally or unintentionally.