

Construction Ruleset

Version 2026–27.1, Effective Jul 10, 2026

Welcome to the Impact Robotics League! This ruleset applies to the Plastic Ant (1 lb) class in the Middle School and High School divisions. It limits materials to commonly available 3D-printable plastics. Open has no IRL construction limits and follows the current SPARC rules, with the IRL exception that TPU drive and weapon belts are allowed.

Disclaimer: These rules are subject to change to ensure fairness, safety, and fun. We reserve the right to modify these guidelines as the season progresses. We will always communicate changes clearly and in advance!

1. Weight & Locomotion

- **Standard Weight Class:** Your robot must weigh 1lb (454g) or less.
- **Weight Bonuses:** You can receive a weight bonus for using alternative locomotion:
 - **Shufflers:** Up to 1.25 lbs
 - **Non-Traditional:** Up to 1.5 lbs
 - **Walkers:** Up to 2 lbs

2. Materials & Fasteners

- **Chassis, Armor, and Weapons:** Must be 3D printed from one of the following materials: **PET, PETG, ABS, PLA, PLA+, or ASA**. No other plastics, metals, or composite materials (like carbon fiber PLA) are allowed for these components.
- **Non-Plastic Parts:** Commercially available parts such as motors, electronics, axles, fasteners, and wheels can be any material, but cannot be used in such a way to enhance the structural integrity, armor the robot, or enhance any weapon. Magnets are not allowed for downforce or traction.
- **TPU:** TPU is banned except for drive and weapon belts. TPU belts are allowed.
- **Post-Processing:** Post-processing of materials is strictly prohibited. This includes but is not limited to annealing, acetone soaking, using soldering iron to strength materials, and boiling of plastics. Soldering irons may be used to fuse/repair broken parts during pit repairs at the day of competition, provided it does not go against the spirit of this rule.
- **Fasteners:** All bots must make reasonable efforts to recess exposed screws, bolts, and metal hardware. Countersunk or recessed fasteners are preferred. Large or protruding bolts that can easily be struck during normal engagement are not allowed.

3. Electronics & Batteries

- **Battery Handling and Containment:** Install LiPo or LiHV batteries only during match preparation or approved testing. After a match or test, remove the battery and put it in a LiPo/LiHV-safe bag or container. Store and charge LiPo and LiHV batteries only in a LiPo/LiHV-safe bag or container.
- **Maximum Voltage:** The 3S cap (11.4 V nominal for 3S LiHV) is mandatory for Middle School and High School. Event class listings show this cap.
- **Power Disconnect:** Your robot must have an easy-to-access mechanical power disconnect (e.g., FingerTech switch or removable link) for drive and weapon systems. Relays may be used but are not a substitute for a mechanical disconnect.
- **Battery Securing:** The battery must be securely contained inside the chassis and not visible or strikeable from the outside.
- **Insulation:** No exposed battery terminals or electrical contacts. All must be insulated with heat shrink, tape, or enclosed connectors.
- **No Protrusions:** No construction screws may contact or protrude into the battery compartment.
- **Power Light:** A light must be clearly visible on the outside of the robot to show when power is active.
- **Radio Control:** The robot must be controlled by a 2.4 GHz radio system. Toy radio systems (27MHz, 49MHz, or Bluetooth) are not permitted.
- **Fail-Safe:** Your radio system must have a fail-safe that automatically stops all drive and weapon motion if the transmitter loses power or signal.

4. Safety

- **Deactivation:** The robot must be able to be fully deactivated (including drive and weaponry) in under 60 seconds using the manual disconnect.
- **Weapon Safety:** Any moving weapon that could cause damage or injury needs a clearly visible lock whenever the robot is outside a closed arena or test box. Remove the lock only after the robot is inside the secured enclosure. At an event, wait for an official to give the go-ahead.
- **Weapon Speed:** Spinning weapons cannot exceed 250 miles per hour (MPH) at the weapon tips.

5. Wheels & Padding

- **Wheels:** Off-the-shelf wheels are permitted, including foam and rubber hobby tires and molded plastic wheels such as LEGO wheels. Custom wheels, including custom cast wheels, are allowed when they comply with the current SPARC rules.
- **Padding:** Non-structural padding and shock-absorbing materials are allowed, including foam, rubber, and silicone. These materials must not be used for a functional weapon or to enhance armor. TPU may not be used for padding.

6. Prohibited Items

- **Absolutely forbidden:** The following are not allowed:
 - Electrical weapons or RF jamming.
 - Entangling weapons (nets, strings, etc.).
 - Liquids, foams, or gases that require cleanup.
 - Untethered or tethered projectiles.
 - Heat, fire, and explosives.
 - Pneumatic or hydraulic systems.

7. Motors & Divisions

- Middle School and High School: The 3S power cap is mandatory. Drive motors must be brushed. Brushless weapon motors are permitted.
- Custom wheels: Custom and custom-cast wheels are allowed in every division when they comply with the current SPARC rules.
- Open: IRL adds no construction limits. The robot must comply with the current SPARC rules. The one IRL exception is that TPU drive and weapon belts are allowed.

8. Violations

- Event organizers may disqualify or restrict a robot that is unsafe, noncompliant, or damaging to the arena. Repeated or deliberate violations can cause a match forfeit or event disqualification.
- **Spirit of the Class:** Event organizers reserve the right to disqualify a robot if it violates the "spirit of the class," so it's best to contact them if you are unsure about your design.

9. Questions?

- For clarifications or pre-approval of borderline components, contact your event host prior to competition day.

Change Log:

July 10, 2026 Middle School and High School: mandatory 3S cap and brushed drive. Custom wheels are allowed when SPARC-legal. Open follows SPARC rules, with TPU drive and weapon belts allowed.