



Safety Overview

2015 TORC Season Kickoff



TORC Safety

Everyone is responsible for safety during:

 **Team Meetings**

 **Design and Prototype**

 **Build and Test**

 **Travel to and from events**

 **Team Events**

 **Competition Events**

 **Sponsor Events**

 **Team Building Events (Jr. FLL, FLL, FTC)**

TORC Safe Practices

- 🚧 No running, throwing objects or excessive horseplay
- 🚧 Clean up work area after use
- 🚧 Respect everyone and the equipment
- 🚧 Do not distract people using machinery
- 🚧 Be aware of where the First Aid, Eye Wash Station, and Fire Extinguisher (See Map)
- 🚧 Wear proper equipment and attire while in work areas
- 🚧 Inform Safety Captain or a Mentor of any break in safety rules, safety problems, or breakage of machinery

TORC Personal Protection Equipment - PPE

Eye, Face and Head

- Safety glasses with side shields or goggles**
- Face shields and welding helmet
- Hair pulled back away from face and well managed in the Fab Shop and in Mechanical Assembly

Hand

- Proper gloves (where needed)
- No Rings, Metal Bracelets or Metal Watches when working with electrical

Hearing

- Earplugs or sound proof headset

Feet

- Completely closed shoes**
- Steel-Toe shoes recommended in Fab Shop

Other

- No loose clothing
- No Hanging / Dangling objects (hair, necklace, earrings, bracelet, body piercings) in Fabrication Shop

Safety Glasses

Safety Glasses

- ⚠️ ANSI- approved, UL- listed, CSA rated
- ⚠️ Clear or lightly tinted (yellow, rose, blue, amber)
- ⚠️ No reflective or dark glasses, eyes must be visible

Prescription Glasses

- ⚠️ Non-safety rated prescription glasses, you must wear safety goggles or glasses
- ⚠️ You may use side shields if you're wearing safety rated glasses and not working with machinery.

To be worn when doing any work on/with the robot including grinding, drilling, soldering, cutting, welding, etc. Also when there is anything to do with splashes, sprays or splatters.

At events in the pits and on the field you must wear safety glasses, it says in the *FIRST* Safety Manual.

TORC Member Responsibilities

- 🚧 Work in a safe responsible manner
- 🚧 Use PPE
- 🚧 Report any unsafe / hazardous conditions and practices that may cause injury to persons or damage to equipment to a Mentor, Team Captain, Safety Captain and/or Safety Advisor
 - 🚧 Where possible, help to eliminate the hazardous condition before someone is injured
- 🚧 Lead by Example
 - 🚧 Provide guidance, leadership and advice for:
 - 🚧 behavior in the work place
 - 🚧 Usage of tools
 - 🚧 Best practices for use of components
- 🚧 If you're not familiar with, equipment don't use it
 - 🚧 Ask for instruction or guidance
- 🚧 If not familiar with the basic safety of the machines in the fabrication shop, especially the mill and lathe, **DO NOT ENTER THE SHOP WHILE THE EQUIPMENT IS IN USE**

TORC Member Behavior at Events

- 🚧 Don't Run
- 🚧 Assist other teams, mentors and inspectors
- 🚧 Buddy system or tell someone where you're going

Parents, Family and Students entering Competition Pits

- 🚧 Safety Glasses with Side Shields or Goggles Required
 - 🚧 Prescription Glasses without side shields are not acceptable
 - 🚧 Prescription Glasses with temporary slip on side shields are not acceptable
 - 🚧 Safety Glasses available at the door to the pits for non-team students and family, please return on exit.
- 🚧 Children under 12 must be with someone 18+
- 🚧 Stay Alert
- 🚧 Closed Toe and Heel Shoes
- 🚧 No strollers or Baby Carriages
- 🚧 No Food or Open Drinks

Safety Zones

 Blue: Designates Work Areas in TORC 2137 Robot Lab

- Wear Safety Glasses
- No Food or Drink

 Yellow: Fabrication Equipment Hazard Zones

- Stay out unless you are actively operating the machine
- One student at a time

 Red: DANGER! Lethal Danger Present

- This zone is not for students
- Keep out for your own safety

TORC Fabrication Team

- New and modified certification system
 - Level requirements have changed
 - Student Certification Records Retained Online
 - New Student Fabrication Equipment Usage Rules

TORC Fabrication Team Certification Levels

Level 0 – Aware of Basic Safety

Students understand dangers of the machines and know PPE used in our facility.

Level 1 – Trained

Student demonstrates knowledge of safety procedures, personal safety, machine safety, and basic machine use.

Level 2 – Observed

Student demonstrates ability to use machine to fabricate a part to print under the observation of a Mentor.

Level 3 – Refined

Student demonstrates ability to use machine to perform advanced operations under observation.

Level 4 – Create Procedures

Student demonstrates his full understanding of equipment use and his ability to impart his knowledge to others.

Level 0 : **Basic Safety** -- Jar-Jar-Binks

- Pass Test with questions based on information in the safety presentation
- Must pass with an 80%
- Only 5 non-multiple choice questions
- **No pass, no entering the fabrication shop when mill, lathe and welder are in operation**

Depending on what the “robot” mechanical and electrical mentors say, everyone might have to take this test any ways.

Level 1: **Trained**-- Youngling

- Safety Procedures and PPE
- Basic Operation of Machine
- Accurately Measure Features and Layout Parts Accurately using Tape Measures, Scales, and CNC digital readouts.
- Paper test, 80%+
- **Level 1 students may only work under the guidance of Level 4 students or mentors**

Level 2: **Observed** -- Padawan Apprentice

- Read and understand CAD Drawings
- Understand the importance of Tolerances
- Solo work under observation of authorized personal
- **Must work with a Mentor Present in the fabrication shop**

Level 3: **Refined**-- Jedi Knight

- Advanced operation
- CAD Drawing
- No Tolerance
- Solo operation while being observed by mentor
- May work while a mentor is in the robotics room.

Can operate machines without a mentor in the FAB shop but requires a MENTOR in the Robotics room AWARE of the work you want to perform and the machines you wish to use to perform the task

Level 4: Create a Procedure -- The Jedi becomes the Master

1. Student Researches the steps and tools required to perform a given task in a safe and reliable manner.
2. Prepare a procedure in TORC format documenting the process and save the draft procedure in the TORC fabrication drive for others to access.
3. Review the procedure with a fabrication mentor and update with mentors recommendations.
4. Follow procedure on equipment to verify accuracy and ability to meet task requirements
 - Take Pictures
 - Take Notes for Improvement.
5. Update procedure to reflect any changes you identified during the trial run.
6. Observe another student follow the procedure, making notes for areas not understood, ensuring others are able to follow the procedure. Make required changes
7. Provide the finished procedure the mentor for sign-off

Level 4 students may train a student up to level 2 but a mentor must be in the shop and aware that you're training someone.