

School of Engineering
General Safety Rules and Operational Policies for
JEC 2220: Subsonic Wind Tunnel
(Revised: August 2007)

Emergencies

- ✓ Report all emergencies to your instructor or RPI staff member. If an injury needs prompt medical attention, call **Public Safety at extension 6611**.
- ✓ Do not attempt to move an injured person.
- ✓ First-aid kits are available in the lab for minor injuries
- ✓ Do not attempt to clean up any bodily fluids under any circumstances.
- ✓ In case of fire or hazardous chemical spill evacuate the premises immediately.

General Operational and Safety Policies

- ✓ Only current RPI faculty, staff, and students who have been properly trained and authorized are allowed to directly operate equipment (wind tunnel, machine tools, and electronic equipment) or any other type of power equipment in the lab.
- ✓ Students are not permitted to operate the tunnel or work in the lab without the supervision of the lab technician or an authorized and trained instructor, staff member, or teaching assistant (TA).
- ✓ Use the buddy system and watch out for other people. If you are aware of an unsafe situation, please report it to your instructor or staff member.
- ✓ Use of tobacco products, alcohol, and illegal substances is prohibited in the lab. **DO NOT OPERATE ANY MACHINES** if your abilities are impaired for any reason (examples: personal illness, lack of sleep, drugs or alcohol).
- ✓ Everyone is responsible for housekeeping and cleaning up after themselves. Aisles and doorways, including access to the service hallway and electrical boxes, are to be kept clear for purposes of safe passage.
- ✓ Report any cases of vandalism or theft to your instructor, staff member, or TA.
- ✓ Students should not perform any type of maintenance on equipment in the lab without prior authorization and direct supervision of the lab manager.
- ✓ Use appropriate safety equipment for the task at hand (i.e., safety glasses, ear protection, gloves). See your instructor or a staff member for guidance.
- ✓ Report all spilled fluids immediately (since they are an extreme slip hazard).
- ✓ All chemical containers must be labeled as to their contents
- ✓ Material Safety Data Sheets (MSDS) are available on line at www.msds.rpi.edu .
- ✓ Oil soaked rags or rags with any type of solvent are to be disposed of in proper containers. Do not dispose of these items in regular trash containers.
- ✓ **Do not tamper with projects, experiments, machine set-ups, or prototypes that are not under your jurisdiction and/or not part of the current lab activities.**

Wind Tunnel Safety

- ✓ The Main Disconnect for the wind tunnel is located on the South wall of the lab. The disconnect is to be locked off when not in use to prevent accidental startup, unintended energization and/or unauthorized operation of the tunnel. See the lab technician for assistance if the tunnel is locked out.
- ✓ Emergency stop (off) buttons are located near each exit of the lab.
- ✓ The tunnel motor changes speed slowly. On shutoff, be aware that it may take a minute or more to fully stop, and flow to cease in the tunnel.
- ✓ The tunnel should only be operated with the test section fully closed (both access doors, both window panels, both floor panels in place.) Should operation in a different state be considered, please contact the technician/instructor/TA before proceeding.
- ✓ All experiments must have a reviewed and approved test plan in place prior to proceeding. See the instructor for assistance and examples.
- ✓ **Carefully verify that the visible portions of the tunnel, and the test section is clear of all loose parts, tools, fasteners, debris etc prior to energizing the tunnel** for each run. This should include a thorough inspection at the start of each day or each lab session, including looking up and down stream in the tunnel. Do not assume

things are as you left them from prior sessions. Failure to do so can result in a safety hazard, and/or damage to the tunnel.

- ✓ **Properly secure all models and other equipment installed for a test.**
- ✓ Ear Protection is recommended for operation of the wind tunnel above 150 Feet Per Second (command frequency > 30 Hz or command voltage > 5 volts)
- ✓ The wing section models used in the Experimental Fluid Dynamics Laboratory class are only qualified through 200 FPS speeds in the tunnel. Do not operate them above this speed.
- ✓ **Only open the test section doors after the tunnel has fully stopped and is shut off.**
- ✓ Use caution when opening the test section doors – the hydraulic openers are strong, and can and will move the doors very quickly.
- ✓ Do not enter the tunnel or test section. It can present a significant safety hazard, and hazard to the equipment. Should a model or other materials end up out of reach in the diffuser or contraction section, or you observe other materials in these areas (e.g., on the diffuser model catching screen), notify the technician/instructor/TA immediately.
- ✓ Follow the wind tunnel operating checklist for startup and shut down of the tunnel.
- ✓ Turn off all equipment before leaving for the day.

Equipment Precautions

- ✓ Many of the sensors, models and instruments used in the class are fragile, and very expensive. Use care when handling them. When in doubt, ask your instructor or TA about proper handling and care.
- ✓ Hot wire anemometer probes/sensors are very fragile!!! Handle with extreme care. Even a slight bump or small particle contact can destroy them.
- ✓ The MINI-6 sting mounted sensor is both very expensive, and relatively fragile. When not in use, it must have the shield in place, no exceptions!! It has limited ability to withstand external loads, especially sharp impacts and torque loads. Do not mount models to the strut without specific training for the mount system in question. Do not tighten the retainer nut with the sensor mounted to the sting. Use care in calibration. See the technician/instructor/TA for any questions.
- ✓ The tunnel walls, sides and bottom are clear acrylic. Visual clarity is important for many of our experiments. Take great care to avoid scratching the tunnel (inside and out). Use the tunnel mats inside the tunnel to protect the lower surface during any work in the test section. Should a scratch occur – see the technician/instructor/TA – many scratches can be removed or minimized with proper treatment.

In reviewing this sheet and signing the class safety sheet list, I acknowledge that I have carefully read and fully understand the general safety rules and operational policies of the JEC Subsonic Wind Tunnel Laboratory, and I will comply with them. I also realize that other, undefined hazards will exist in the lab areas and therefore, my safety, and that of others, is ultimately my own responsibility. Please contact Prof. Michael Amitay if you have any questions relative to this information.

NOTE: Persons violating safety rules or operational policies are subject to appropriate disciplinary action and/or immediate dismissal from the area.