

# GreenFlo Acidhood

## Standard Operating Procedure

CORAL Name: **GREENFLO**  
Model: Reynolds Tech GreenFlo Wet Station  
Location: TRL Outer Window Hallway  
Purpose: General purpose wet hood for processing with acids and bases.  
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### Introduction

The Reynolds Tech GreenFlo wet bench is a state of the art system offering the latest technology for vapor and fume containment in conjunction with the lowest cost of ownership while reducing exhaust emission by over 50%. Moveable sash partitions allow for a lower volumetric exhaust flow while maintaining the required face velocity for safe processing of hazardous materials. Features of the wet bench include dual aspirators, a quick-dump rinser, gooseneck and hand-sprayers for DI water, and a recessed well for processing in tall beakers or on hotplates. This hood is for processing of acids and bases only.

### Safety

Read and understand the SOP for [Acid Processing Rules](#). Acid protective gear **MUST** be worn when working at this sink and when transporting or handling chemicals. An acid-proof apron, sleeve guards, Trionic gloves (atop the standard gowning vinyl cleanroom gloves), and a face shield worn over safety glasses, are all required. **ALWAYS** know the location of the nearest eye wash and safety shower.

Before using the acid-hood, verify that the exhaust is working on the exhaust monitor. The louvers must be open, and the plastic sashes must be down and in place. Note: The louvers have been set for proper flow, and must not be adjusted. Never, for any reason, put your head inside the hood.

Chemicals must be transported to and from the acid hood using the chemical cart. Handling of chemical bottles, beakers, or other vessels must always be done with dry acid-gloved hands. Typically, acids should be added last to solutions. A variety of acids and bases including specialty etchants are available in the TRL acid passthrough or in the blue acid cabinet in the ballroom area. MSDS sheets for all chemicals can be found in the yellow binders on the 2<sup>nd</sup> and 4<sup>th</sup> floors near the elevators or online. Users should review and be familiar with the appropriate MSDS before using these chemicals.

In case of chemical exposure, call for help to the person nearest you and tell them to call for assistance. While you are speaking to the person nearest you, get to the nearest shower or eyewash as fast as possible. Immediately remove all contaminated clothing and flush or rinse the exposed area with water for 15 minutes; exposures to HF should be rinsed for 5 minutes followed by application of

Calgonate Gel. Immediately after treatment report to MIT Medical for examination by a physician. In emergency situations you can call 100 for MIT police from any campus landline, or 617-253-1212 from a cell phone and request an ambulance for transportation.

The chemicals used in the acid-hood are all dangerous to touch or inhale. HF acid is especially hazardous. An insidious aspect of HF burns is that there may not be any discomfort until long after exposure. These burns are extremely serious and may result in bone tissue damage. If you suspect exposure to HF, flush the area well for 5 minutes and be sure to work under and around your fingernails, then apply calcium gluconate liberally to exposed area. Immediately after treatment report to MIT Medical for examination by a physician. Remember, HF may not produce any burning sensation until after it has already done damage.

## **Procedure**

1. Check reservations in CORAL to ensure you have reserved the correct machine at the correct time. Engage the tool in CORAL.
2. Prepare your samples by placing them in the correct carrier. Contamination control is of critical importance in all MTL equipment. You should know which color-coded category your samples fit into (brown, green, blue, red, yellow) and use the appropriate labware for processing the samples. Cross contamination can be harmful to equipment as well as to experimental results. Both acid hoods in TRL allow processing of all sample types so it is very important to respect and maintain contamination control. If you have any questions please contact MTL Staff.
3. Gown up by donning the appropriate safety gear in this order:
  - a. Apron
  - b. Face Mask
  - c. Purple Arm Sleeves
  - d. Yellow Trionic Gloves

If any of the safety gear is damaged or in poor condition please discard it and get new gear.
4. Obtain the appropriate labware and beakers and place them in the hood. Do not touch the inside of beakers or cassettes with your hands since this can introduce contamination. Etchants that contain Hydrofluoric Acid (HF, BOE, etc.) should be used with Teflon beakers; other acids can be processed in quartz labware. For tall beakers or processing on a hotplate remove the covers from the recessed wells and place the beakers inside – the covers may be hung on a hook provided on the left side of the deck.
5. Using the chemical cart, retrieve the necessary chemicals from the passthrough or blue cabinet and transport them to the hood. Place the chemical bottle inside the hood, remove the cap, pour the required amount of chemical into the processing beakers remembering to always add acid to water. Replace the cap, move the bottle back to the cart and immediately transport the chemicals back to the passthrough.

- a. NOTE: the sash may be lifted temporarily to move bottle or equipment in and out of the hood. The sash should be in the down position at all other times. The GreenFlo hood has an alarm that will sound when the sash is up.
6. Process your samples as required. For hotplates and sonication there are electrical outlets inside the hood that are protected by ground-fault-interrupt. When submerging samples in the etching solution please exercise caution to avoid splashing.
7. When the processing is complete samples must be rinsed.
  - a. For CMOS compatible wafers (green and blue categories) a quick-dump rinser (QDR) is available. Run a cycle without wafers first, then transfer wafers into the QDR and press "Cycle Start/Reset". The wafers will be rinsed automatically and an alarm will sound when the cycle is complete. Press "Cycle Start/Reset" again to silence the alarm and transfer the wafers to the green spin-rinse-dryer (SRD) near the acidhood in the Ballroom area.
  - b. For non-CMOS wafers (red and yellow categories) users should fill a second beaker with water inside the sink. Transfer the wafers to the water beaker and then allow water to "cascade" for 2 minutes. Aspirate the water from this vessel, refill and allow to "cascade" for 2 minutes longer. Repeat this process 4 times then transfer wafers to the red SRD next to the acidhood.
  - c. For PIECES (all categories) users should use appropriately sized beakers to rinse and cascade with water for a total of 4 cycles. A "piece spray rinser" is available in the sink as well: this rinser lightly sprays water on samples and has a small basket to prevent pieces from falling into the sink. The spray rinser can be used along with beaker rinsing. When rinsing is complete N2 guns are available to blow dry samples.
    - i. NOTE: fab wipes are not allowed inside the hoods for drying samples.
8. Aspirate chemicals from the beakers, rinse and clean the labware. Acids and bases should never be dumped directly down the drain. Separate aspirators are available for CMOS (green and blue) and non-CMOS (red and yellow) labware. Beakers should be aspirated with the appropriate hose, filled with water and aspirated again. The cycle should be repeated so that the beakers have been filled with water 3 times. Upon completion dump any remaining water into the sink and return the labware to the appropriate shelf.
9. Spray the hood deck down with water to rinse away any spilled chemicals. Return covers to the recessed wells. Rinse gloves with water and dry with a fab wipe. Remove safety gear in the following order:
  - a. Yellow Trionic Gloves
  - b. Purple Arm Sleeves
  - c. Face Mask
  - d. Apron

10. When processing is complete and the hood is clean and ready for the next user, you may disengage from the tool in CORAL. Please be sure to enter accurate processing information into the CORAL dialogue as this is used for billing and tool maintenance.