

Cleanroom Spill Response Procedure

A. INITIAL RESPONSE AND RISK ASSESSMENT

If an explosion hazard, fire hazard, and/or toxicity hazard exists:

1. Pull the fire alarm and evacuate all personnel.
2. If safe to do so, turn off ignition sources and nearby equipment.
3. Do not attempt to remove injured persons if doing so risks your health and/or safety, or risks further injury to the injured.
4. If safe to do so, note the hazardous materials involved. Arrange to secure the Material Safety Data Sheet (MSDS) for the materials involved in the incident. MSDS will be needed by responding emergency personnel.
5. Evacuate the building and locate 4D LABS staff and Campus Security emergency responders to relay significant details about the emergency.
6. Submit an online EHS Incident Report at www.sfu.ca/security.

If no immediate safety risk is present, proceed to section B.

B. SPILL SIZE ASSESSMENT

A **major spill** is:

- a. A spill of 50mL or greater, or
- b. At risk of chemical vapours exceeding safe levels.

A **minor spill** is:

- a. One that does not meet the major spill criteria, and;
- b. Is assessed to pose minimal risk to lab occupants during spill cleanup.

C. SELECT APPROPRIATE RESPONSE

In the event of a **major spill**:

1. Alert others nearby and immediately evacuate the area. **DO NOT ATTEMPT TO CLEAN UP.**
2. Call Campus Security at 2-4500.
3. Call 4D LABS staff: Grace Li (2-8075), Mohamad (2-3790), Nathanael Sieb (2-8084).
4. Put a barrier and sign to prevent entry to the affected area.
5. Standby for emergency responders and provide information as per request.
6. Submit an online EHS Incident Report at www.sfu.ca/security.

In the event of a **minor spill**:

1. Alert others nearby and inform them of the potential risks.¹
2. If in need of assistance, contact the appropriate 4D LABS staff member.
3. Select the appropriate clean up procedure from the available options in Section D.²
4. After clean-up, rinse contaminated PPE with plenty of water to remove any chemical residues before reusing.
5. Notify 4D LABS staff to replenish materials used for spill response and to discuss corrective/mitigative action for future occurrences.

¹ Ensure you are working in a well ventilated area.

² Ensure you are familiar with this procedure, along with the waste disposal procedure and other relevant policies which may be applicable.

D. CLEANUP PROCEDURES

SOLVENTS Examples: Acetone, Isopropanol (IPA), Ethanol, Ethylene Glycol, Photoresists, PGR Remover

1. Retrieve the universal sorbent pads, located within the wall box inside the Acid Bench Room.
2. Place a sorbent pad on the spill. Ensure to catch any chemical runoff.
3. Dispose the pad(s) into a plastic bag. (Plastic bags are located on the top of the wall box.)
4. Label the plastic bag indicating the appropriate solvent(s) and place the plastic bag into **Transfer Bay 1 (OUT)**. (Stickers are located within Transfer Bay 1.)
5. Request 4D LABS staff to place a hazardous waste pick up request on your behalf.

HYDROFLUORIC ACID (HF)

1. Ensure that all required **Personal Protective Equipment (PPE)** is equipped as mandated.
2. Gently spray with the HF Acid Eater, working from the outside of the spill inward.³
3. Test with pH paper to confirm neutralization (the PH should be between 6 and 9).
4. Allow neutralized liquid to cool.
5. Retrieve the universal sorbent pads, located within the wall box inside the Acid Bench Room.
6. Place a sorbent pad on the neutralized spill. Ensure to catch any chemical runoff.
7. Place used sorbents into the normal garbage can for disposal.⁴
8. Clean the spill surface area with water at least two times and wipe to dry.

ACIDS Examples: Hydrochloric (HCl), Nitric (HNO₃), Sulfuric (H₂SO₄)

1. Find the acid neutralizer bottle, labelled "KOLOR-SAFE® LIQUID NEUTRALIZER for ACID SPILLS."
2. Gently spray with the acid neutralizer, working from the outside of the spill inward.
3. Test with pH paper to confirm neutralization (the PH should be between 6 and 9).
4. Allow neutralized liquid to cool.
5. Retrieve the universal sorbent pads, located within the wall box inside the Acid Bench Room.
6. Place a sorbent pad on the neutralized spill. Ensure to catch any chemical runoff.
7. Place used sorbents into the normal garbage can for disposal.⁴
8. Clean the spill surface area with water at least two times and wipe to dry.

BASES Examples: Ammonium Hydroxide (NH₄OH), Potassium Hydroxide (KOH), Sodium Hydroxide (NaOH)

1. Find the base neutralizer bottle, labelled "KOLOR-SAFE® LIQUID NEUTRALIZER for BASE SPILLS".⁵
2. Gently spray with the base neutralizer, working from the outside of the spill inward.
3. Test with pH paper to confirm neutralization (the PH should be between 6 and 9).
4. Allow neutralized liquid to cool.
5. Retrieve the universal sorbent pads, located within the wall box inside the Acid Bench Room.
6. Place a sorbent pad on the neutralized spill. Ensure to catch any chemical runoff.
7. Place used sorbents into the normal garbage can for disposal.⁴
8. Clean the spill surface area with water at least two times and wipe to dry.

³ Atomize HF Acid Eater into surrounding air to neutralize any vapors.

⁴ Follow guidelines provided in the Waste Disposal procedure.

⁵ Do NOT use Kolorsafe Base Neutralizer on any solution containing metallic nitrates, cyanides, sulfides, oxidizers, or hypochlorate solutions.