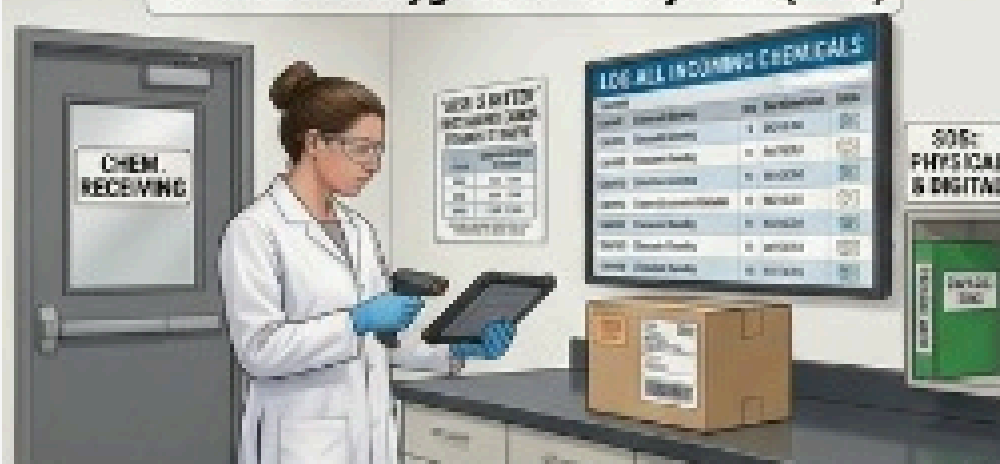


Industrial Laboratory Safety Manual

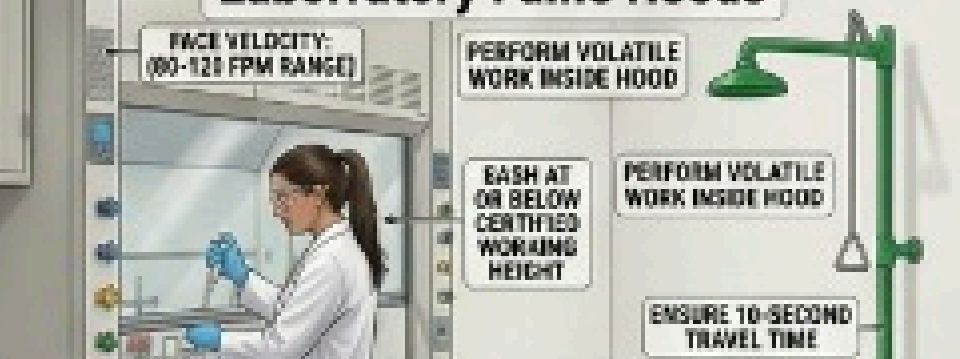


3.3 Storage Matrix and Compatibility

3. Chemical Hygiene & Safety Plan (CHP)

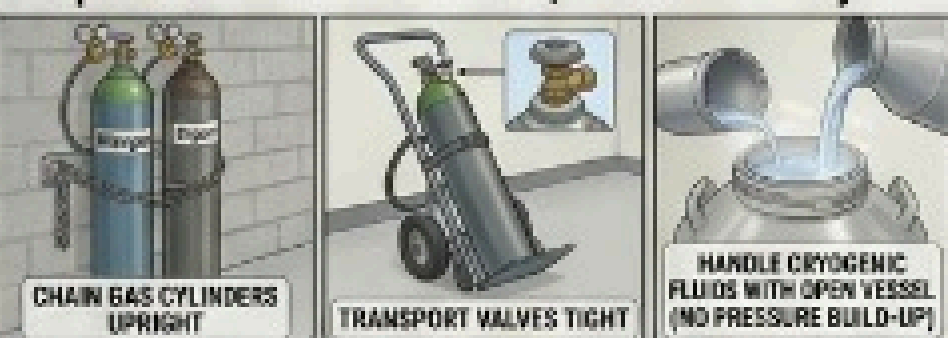


Laboratory Fume Hoods

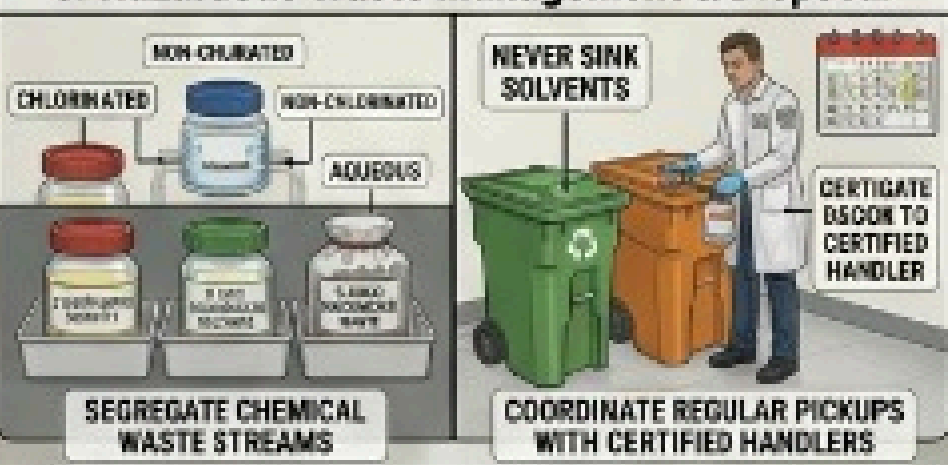
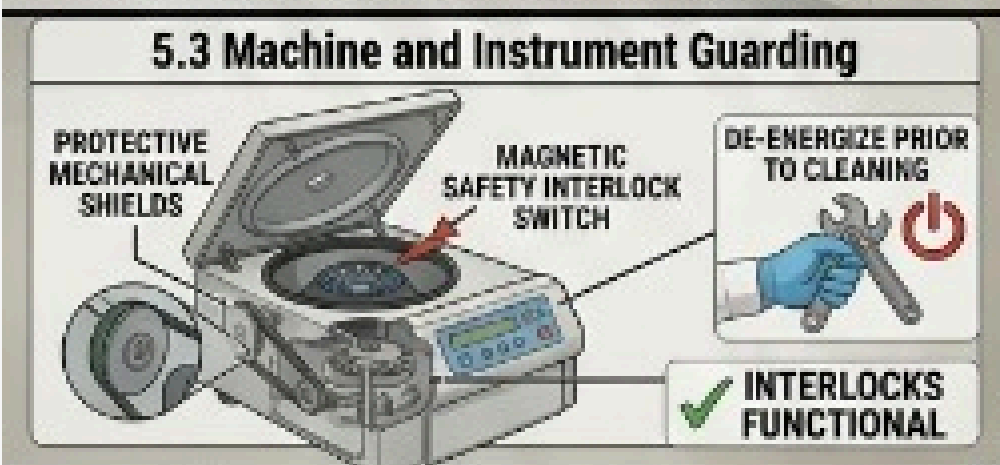


5. Specialized Hazards: Electrical, Mechanical & Physical

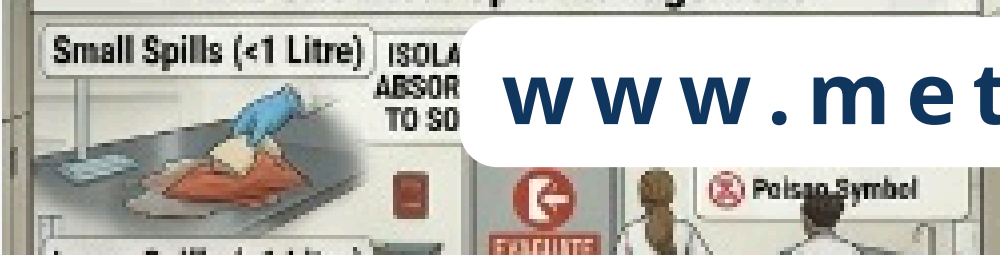
3.2 Labeling and Globally Harmonized System (GHS)



6. Hazardous Waste Management & Disposal



7.2 Chemical Spill Management



7.3 Fire Response



7.4 Accident Reporting

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General Laboratory Protocols & Administration

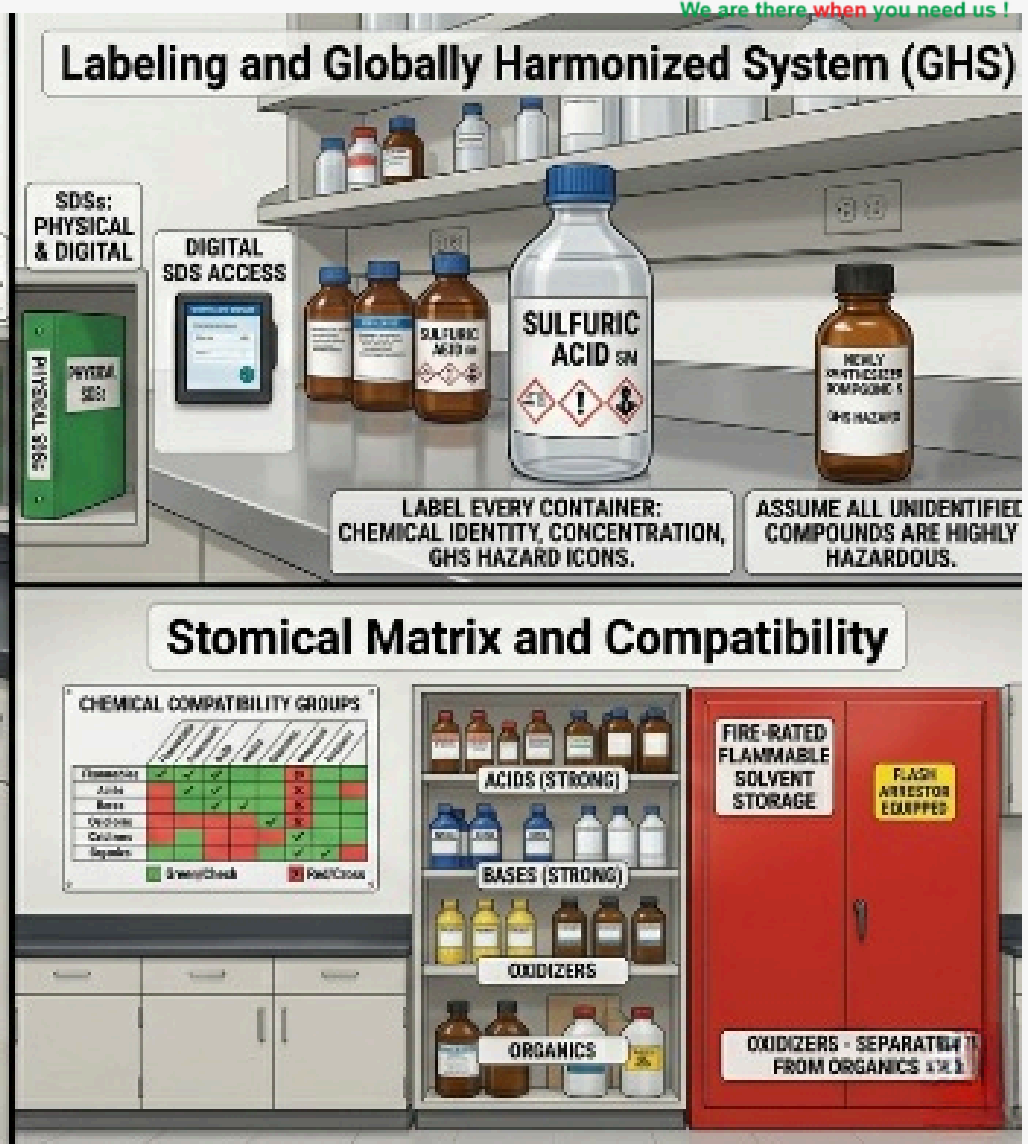
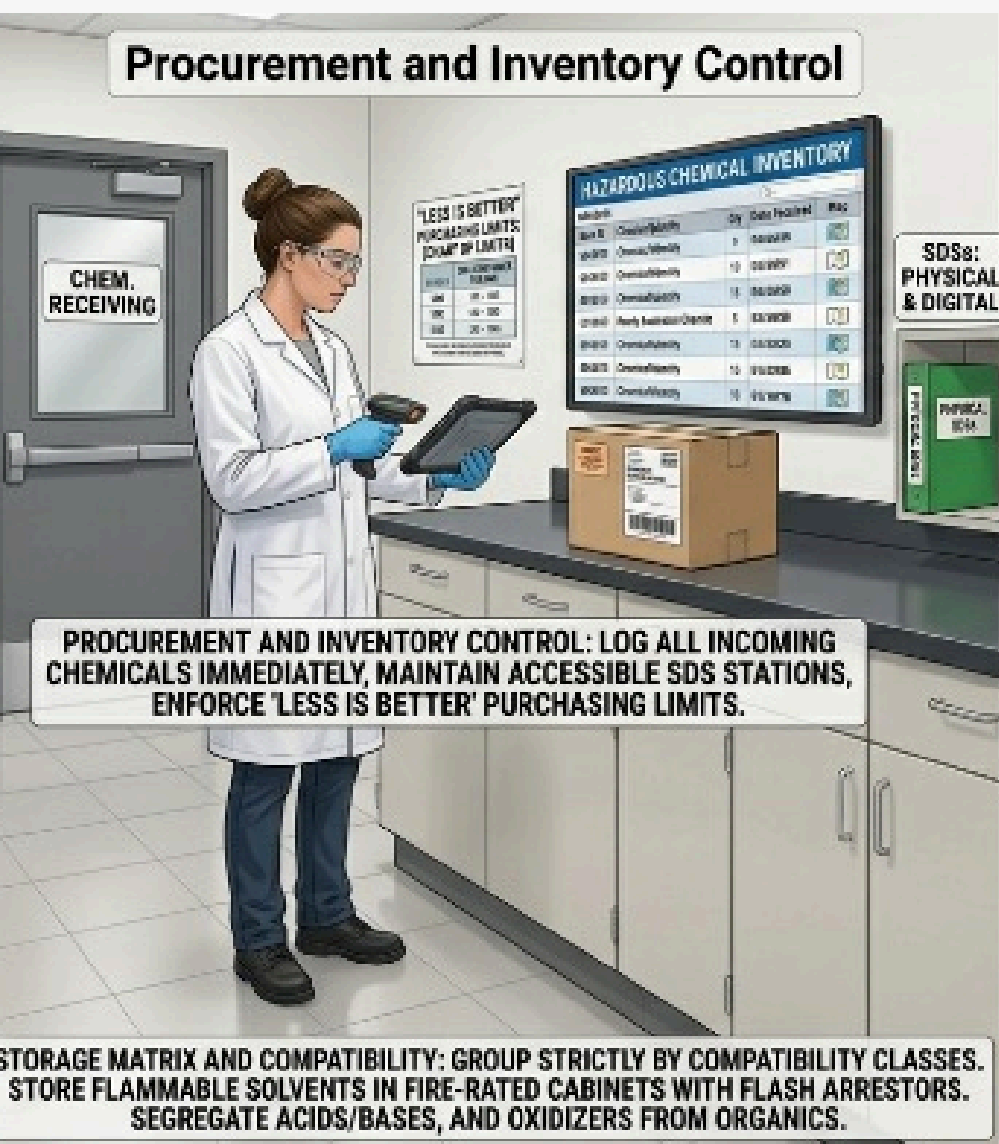


Standard Rules of Conduct

- Dress appropriately: long pants, closed-toe shoes, and restrained hair are required at all times.
- Do not eat, drink, smoke, apply cosmetics, or handle contact lenses within the laboratory area.
- Avoid all horseplay, practical jokes, or unapproved experiments.
- Prohibit working alone with highly hazardous materials without an authorized "Buddy System" protocol.

Facility Housekeeping

- Maintain clean walkways, clear exit paths, and unblocked access to emergency gear.
- Keep all workspaces free of clutters, unused glassware, and accumulated waste.
- Ensure proper ventilation by verifying that exhaust grilles and air returns are clear.



CHEMICAL HYGIENE & SAFETY PLAN (CHP)

Procurement and Inventory Control

- Log all incoming chemicals immediately into the facility's Hazardous Chemical Inventory system.
- Maintain accessible physical and digital Safety Data Sheet (SDS) stations for every compound.
- Enforce "less is better" purchasing limits to keep stored container volumes low.

Storage Matrix and Compatibility

- Group chemical inventory strictly by compatibility classes rather than alphabetical ordering.
- Store flammable solvents inside certified fire-rated cabinets equipped with flash arrestors.
- Segregate strong acids from strong bases, and keep oxidizers entirely separate from organic materials.

Labeling and Globally Harmonized System (GHS)

- Label every container with its full chemical identity, concentration, and GHS hazard icons.
- Assume all unidentified or newly synthesized compounds are highly hazardous.

Personal Protective Equipment (PPE) & Engineering Controls

PPE Requirements Matrix			
Hazard Type	Required PPE Component	Standard Compliance	Usage Note
General Chemical Handling	 lab coat, nitrile gloves	ANSI Z87.1	For daily work
Corrosive / Bulk Liquids	 Face shield, heavy neoprene apron, extended-cuff gloves	ANSI Z87.1 / EN 374	For large volume handling
Cryogenic Material Handling	 Cryogenic face shield, insulated gloves, closed apron	EN 511	For liquid nitrogen/helium
Particulate / Vapor Hazards	 Half-face respirator or N95 mask (requires fit testing)	NIOSH Certified	For dusty or volatile materials

Engineering Controls

Laboratory Fume Hoods

FACE VELOCITY: 100 FPM (80-120 FPM RANGE)

SASH AT OR BELOW CERTIFIED WORKING HEIGHT

Safety Showers & Eyewash Stations

SAFETY SHOWERS & EYEWASH STATIONS: ENSURE 10-SECOND TRAVEL TIME

CLEAR PATH

KEEP COMPLETELY CLEAR OF OBSTRUCTIONS

PERSONAL PROTECTIVE EQUIPMENT (PPE) & ENGINEERING CONTROLS

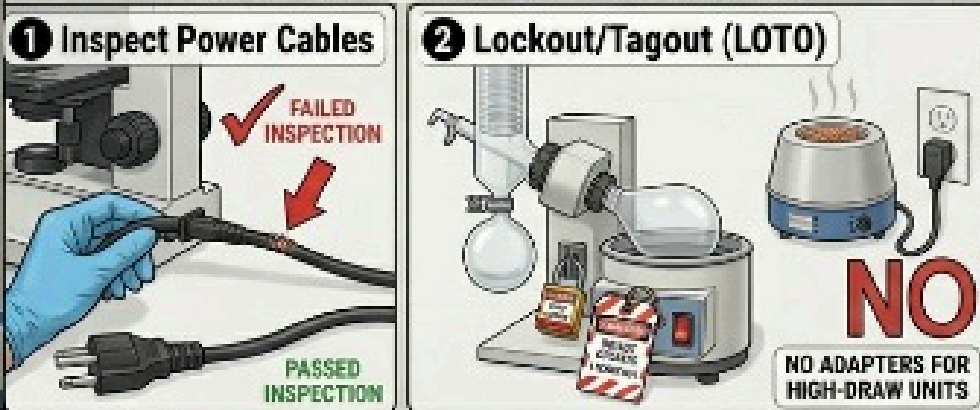
Hazard Type	Required PPE Components	Applicable Standards
 General Chemical Handling	Splash-Proof Safety Goggles,	ANSI Z87.1
 Corrosive Chemicals & Bulk Liquid Handling	Face Shield, Heavy-Duty Neoprene	ANSI Z87.1 / EN 374
 Cryogenic Material Handling	Cryogenic Face Shield, Insulated	EN 511
 Particulate & Vapor Exposure	Half-Face Respirator or N95	NIOSH Certified

Engineering Controls

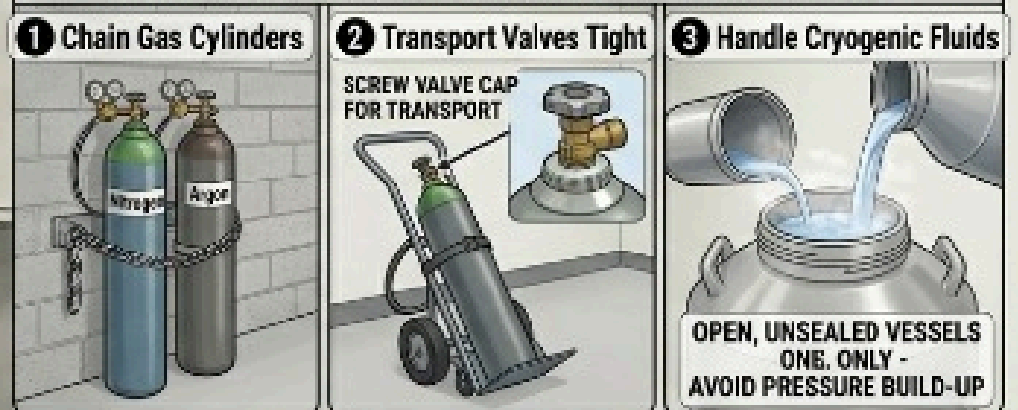
- Laboratory Fume Hoods: Perform all volatile chemical work inside a hood with a face velocity between 80 - 120 fpm. Keep the sash positioned at or below the certified working height.
- Safety Showers & Eyewash Stations: Ensure these units sit within a 10 second travel time from any hazard area. Keep them completely clear of obstructions.

Specialized Hazards: Electrical, Mechanical & Physical

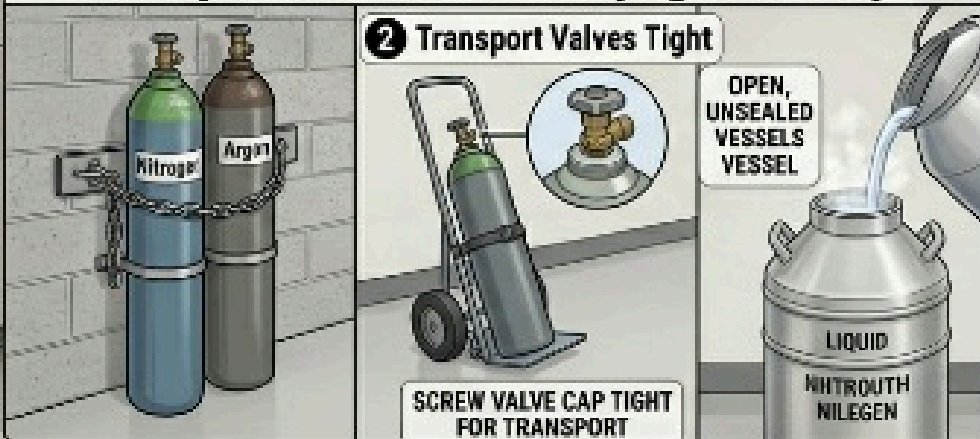
Electrical Safety Regulations



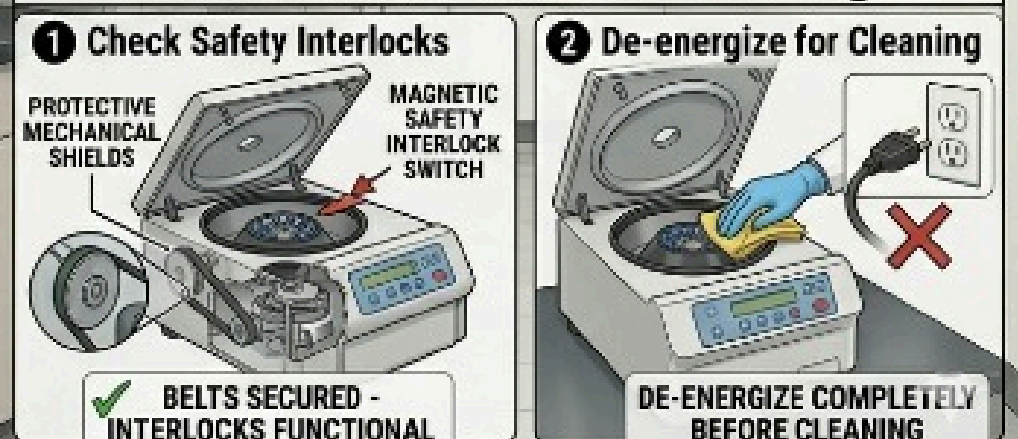
Compressed Gas and Cryogen Safety



Compressed Gas and Cryogen Safety



Machine and Instrument Guarding



SPECIALIZED HAZARDS: ELECTRICAL, MECHANICAL & PHYSICAL

Electrical Safety Regulations

- Inspect all power cables, plugs, and casings for visible fraying before turning on equipment.
- Label non-functional or damaged hardware with physical Lockout/Tagout (LOTO) tags immediately.
- Do not use extension cords or multi-plug adapters to power high-draw heating units.

Compressed Gas and Cryogen Safety

- Chain all compressed gas cylinders upright to structural walls using heavy-duty brackets.
- Transport gas tanks only with their protective metal valve caps screwed tight.
- Handle cryogenic fluids like liquid nitrogen with open, unsealed vessels to avoid pressure build-up.

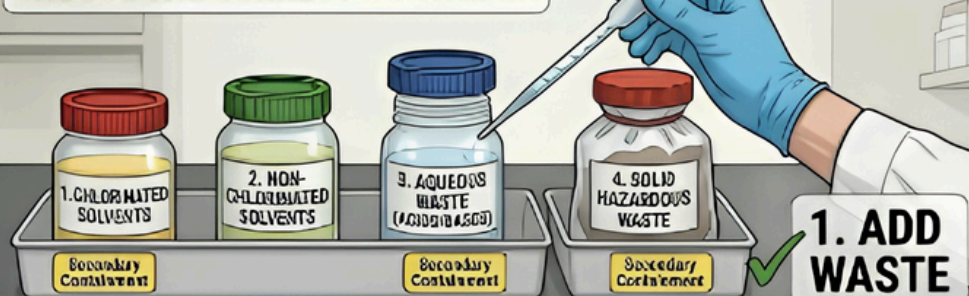
Machine and Instrument Guarding

- Check that all mechanical shields, belts, and safety interlocks are fixed securely in place.
- De-energize instruments completely prior to attempting internal cleanings or physical updates.

HAZARDOUS WASTE MANAGEMENT & DISPOSAL

Waste Collection and Containment

SEGREGATE CHEMICAL WASTE STREAMS AT GENERATION POINT.
CHOOSE THE CORRECT CONTAINER



KEEP ALL HAZARDOUS WASTE COLLECTION JARS
SEALED TIGHT EXCEPT WHEN ADDING WASTE.

SEALED



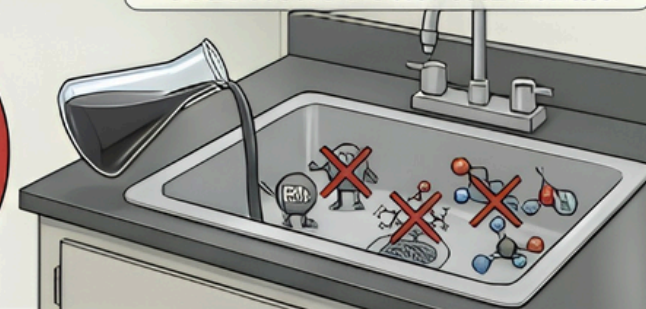
2. SEAL CONTAINERS IMMEDIATELY.

Disposal Procedures

Never Sink Solvents



**NEVER POUR SOLVENTS OR TOXIC
SOLUTIONS DOWN THE DRAIN.**



Coordinate Pickups

COORDINATE REGULAR PICKUPS WITH CERTIFIED
WASTE HANDLERS BASED ON FACILITY SCHEDULE.



Waste Collection and Containment

- Segregate chemical waste streams at the generation point into chlorinated, non-chlorinated, solid, or aqueous containers.
- Keep all hazardous waste collection jars sealed tight except when adding waste.

Disposal Procedures

- Never dump solvents, heavy metals, or toxic chemical solutions down common laboratory sinks.
- Coordinate regular pickups with certified waste handlers based on the facility schedule.

Emergency Response, Incident Reporting & Contacts

Emergency Contacts



EHS Safety Officer:



Facility Security Desk:



Local Fire & Rescue Services:



National Poison Control Center:

Incident Reporting

ASSESS AND ASSIST



ASSESS AND ASSIST

Contain small incidents only if safe.

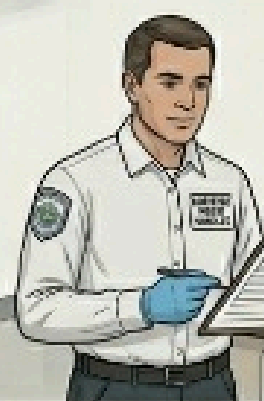
DOCUMENT INCIDENT

Contain small incidents only if safe.



DOCUMENT INCIDENT

Use approved Incident Report form.



REVIEW WITH

EHS. Officer ensures proper follow-up.

EMERGENCY RESPONSE, INCIDENT REPORTING & CONTACTS

Emergency Contacts

- EHS Safety Officer: [Insert Phone Number]
- Facility Security Desk: [Insert Phone Number]
- Local Fire & Rescue Services: Emergency Services
- National Poison Control Center: [Insert Phone Number]

Accident Reporting

- Report every injury, exposure, or near-miss incident to your supervisor within 24 hours.
- Complete the formal facility Incident Investigation Form to identify root causes and prevent recurrences.

Chemical Spill Management

- Small Spills (<1 Litre): Isolate the area, choose proper PPE, and use the nearest chemical spill kit absorbent pillows to soak up liquid.
- Large Spills (>1 Litre): Evacuate the room, pull the fire alarm if the vapor is toxic, and notify EHS immediately.

Fire Response (The P.A.S.S. Method)

- Pull the safety pin located on the extinguisher handle.
- Aim the nozzle directly at the base of the fire.
- Squeeze the operating lever to release the extinguishing agent.
- Sweep the hose from side to side across the fire base until out.



Chemical Spill Management

- Small Chemical Spills (< 1 Litre)
- ✓ Restrict access to the affected area.
- ✓ Wear appropriate Personal Protective Equipment (PPE).
- ✓ Use the nearest Chemical Spill Kit and absorbent materials to contain and absorb the spill.
- ✓ Collect contaminated materials in designated hazardous waste containers.
- ✓ Clean and decontaminate the area according to laboratory procedures.

Large Chemical Spills (> 1 Litre)

- ⚠ Immediately evacuate all personnel from the area.
- ⚠ If hazardous vapors are present, activate the fire alarm and initiate emergency procedures.
- ⚠ Prevent unauthorized entry into the spill zone.
- ⚠ Contact the Environmental, Health & Safety (EHS) Team immediately.
- ⚠ Do not attempt cleanup unless specifically trained and authorized.