

	General Safety Guidelines for Chemical Laboratories	Effective:	February 07, 2006
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		Last Updated:	Anna Maria Miller
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1. Purpose:

1.1 This list of laboratory safety considerations is intended to present general safety concepts that can be adapted to any laboratory.

2. Scope:

2.1. This procedure applies to all technicians employed by the Ross University School of Veterinary Medicine.

3. Procedure

3.1 Access/Exit

- The laboratory should have the proper number of clearly marked, unobstructed exits. The Ross Safety and Security department determines access and exit requirements. Most chemical use laboratories need at least two unobstructed exits.
- Exits must not be locked from the inside.
- Doors equipped with self-closing devices must not be propped open.
- The emergency evacuation plan for the building should be reviewed with laboratory personnel at least annually.
- Work areas should be arranged so that a person does not need to travel through a high-hazard area while attempting to exit the laboratory during an emergency.

3.2 Safety Facilities and Protective Equipment

- Eyewashes and showers must be accessible to all chemical laboratories.
- Laboratory workers should know where the closest emergency shower and eyewash is located.
- Refer to “Emergency Eyewash and Shower Testing Policy” for guidelines and testing of eyewashes and showers.
- Corrosive, irritating, or oxidizing chemicals must only be used in laboratories that have emergency eyewashes within the laboratory.
- Chemical spill kits should be available in laboratories handling corrosives and/or flammables.

- Appropriate face shield, gloves, and rubber apron should be used when handling corrosives.

3.3 Portable **Gas Cylinders**

- Refer to “Compressed Gas Safety” Policy for more information.

3.4 Laboratory **Hoods**

- The ventilation rate should be checked annually. Ross Safety & Security department performs the annual inspections and maintenance. Contact Lynell Nolan @ Telephone # (869) 465-4161 ext. 191 if your hood is past due.
- The hood sash should be marked at maximum use opening (vertical sliding sash only). Do not use the hood with the sash above this mark. If the maximum use opening is not marked, call Lynell Nolan @ Telephone # (869) 465-4161 ext. 191.
- Horizontal sliding sashes should not be removed.
- A visible indicator of hood operation should be provided. Tape-recording tape fastened to the sashes is an inexpensive indicator that laboratory workers can install. The tape should be drawn into the hood. If there is no airflow, stop using the hood; close all containers of hazardous materials and call Lynell Nolan @ Telephone # (869) 465-4161 ext. 191.
- Chemicals stored in the hood must be capped or covered. Avoid storing large amounts of chemicals in the hood; it obstructs airflow and reduces usable space. Do not allow stored chemicals to be in close proximity to Bunsen burners, hot plates, electrical sources, or other chemicals that might be incompatible.
- Work with large amounts of flammable solvents (e.g., distillation, where the vapors may exceed 20% of the Lower Explosive Limit for the solvent) must be done in explosion-proof hoods.
- Biological safety cabinets must have supply and exhaust HEPA filters checked for leakage annually by Ross Safety & Security Department. Call @ 1-869-465-4161 ext. 191 to schedule an appointment.

3.5 Chemical **Storage and Handling**

- Chemical storage areas should be neat, orderly, and clearly identified.
- All chemical containers should be labeled with chemical name, type (acid, base, oxidizer, etc.), and hazard warning.
- Chemical storage areas should be equipped with doors or shelf restraints to prevent material from falling off shelves. Liquids in glass bottles, corrosives, flammables, or other hazardous chemicals should be stored below eye level.
- Incompatible chemicals should not be stored together:
 - Strong acids should not be stored with alkalis (bases).
 - Mineral acids should not be stored with strong oxidizers.

Refer to “Incompatible Chemicals” for more information.

- Highly reactive chemicals should be stored separately in labeled locations. This includes water-reactive chemicals such as base metals.
- Periodically, researchers should closely examine their stock of chemicals and dispose of old, outdated, or unnecessary materials.
- Never mouth pipette. Instead, use rubber bulbs, pipetting aids or automatic pipetters.
- Carcinogens must be handled strictly in accordance with the RUSVM Chemical Carcinogen Safety Program. Visit the RUSVM SafetyWeb website for more information about the RUSVM Chemical Carcinogen program.
- Dispose of hazardous chemical waste in accordance with EH&S guidelines Oxidizers should not be stored with combustible material. Refer to RUSVM SafetyWeb “Incompatible Chemicals” for more information.
- Highly reactive chemicals should be stored separately in labeled locations. This includes water-reactive chemicals such as base metals.
- Periodically, researchers should closely examine their stock of chemicals and dispose of old, outdated, or unnecessary materials.
- Never mouth pipette. Instead, use rubber bulbs, pipetting aids or automatic pipetters.
- Dispose of hazardous chemical waste in accordance with RUSVM guidelines described in SafetyWeb “Guidelines for Disposal of Chemical Waste.”

3.6 Flammable Material Storage and Handling

- All flammable and combustible liquid containers must be clearly labeled and sealed.
- All amounts greater than 10 gallons of Class I flammable liquids (flash point < 100oF) must be stored in a UL approved flammable liquid storage cabinet. Exception: Up to 25 gallons are permitted if in safety cans. Up to 60 gallons may be stored in the laboratory if stored in an approved flammable liquid storage cabinet.
- Quantities greater than 60 gallons of Class I flammable liquids must be in approved indoor storage rooms.
- Glass containers are prohibited, except original glass containers or if necessary to maintain chemical purity. Flammable liquids should be used only in a fume hood.
- Spontaneously flammable materials should be handled under an inert liquid such as mineral oil. Containers must be clearly labeled.
- Flammable liquids should be used only in a fume hood.

3.7 Electrical

- All electrical systems must be installed according to accepted codes. All work on building electrical systems must be performed by O&M.

- Extension cords should not be used as substitutes for permanent wiring. Power outlet strips are considered extension cords. If extension cords are used in permitted manner (such as for computer equipment or for temporary laboratory set ups that will be used for less than six months), they must be approved and labeled by Underwriters Laboratories (UL) and be three-wire grounded.
- Only qualified departmental technicians specifically authorized by the supervisor should repair and install portable electrical equipment.
- All electrical equipment with exposed metal parts must be grounded.
- Special precautions should be taken around water. Laboratory electrical outlets generally do not have ground fault circuit interrupter (GFCI) protection. While working with liquids use extra care to avoid contact with electrical outlets or devices.
- Only lab-safe or flammable liquid storage refrigerators and freezers may be used for storage of any quantity of flammable or explosive chemicals. Household-type refrigerators may be used for storing food, drinks, aqueous solutions, and nonflammable or nonexplosive materials.
- Electrical cords must be three-wire grounded and in good condition.
- Electrical panels must be accessible (30-inch clear space in front). All circuits must be labeled.

See RUSVM SafetyWeb “Electrical Safety Guidelines” for more information.

3.8 Fire Extinguishers

- Fire extinguishers must be available in the laboratory. The Ross Safety & Security Department establishes specific requirements for number and type of extinguishers based on hazards.
- Ross Safety & Security Department should check fire extinguishers annually. Each department should inspect them monthly.
- Fire extinguishers should be fully charged. If you discharge an extinguisher, even partially, notify the Ross Safety & Security Department immediately.
- Fire extinguishers must be accessible and visible.

3.9 Training

- All employees must be trained in all safety procedures, including:
 - The building evacuation plan
 - Spill cleanup
 - Use of the eyewash and shower

Use of Material Safety Data Sheets (MSDS) Employees must be trained in all required job tasks and the training must be documented.

Safety procedures must be enforced to be effective.

An ongoing accident prevention program must be established. RUSVM Safety Web outlines requirements and responsibilities for implementation of safety management programs.

See RUSVM SafetyWeb “Safety Training Tips” for additional information.

3.9 Miscellaneous

- V-belt and pulley drives (e.g., compressor and vacuum pumps) must have guards in place to prevent accidental contact.
- Food and drink must not be consumed in areas where hazardous materials, radioactive materials or biohazards may exist.

For additional information, contact you're the RUSVM Director of Safety & Security at 465-4161 ext, 191 or lnolan@rossvet.edu.kn.