

# Maverick Safety Matters

Environmental Health & Safety

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& S

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## Fire Program Marks Clear Zones in Labs

Laboratory personnel returning to campus this fall may notice some changes in their lab areas. The National Fire Protection Association (NFPA) and the Occupational, Safety and Health Administration (OSHA) require that electrical panels and safety equipment remain clear of any items that could block access to the equipment during urgent or emergency situations.

Over the summer Fire Marshal Moe Jones and Fire Inspector Joel Box have marked spaces around safety shower/eyewash stations, sink mounted eyewashes, fire extinguishers and electrical panels with yellow and black caution tape to designate the area that shall be kept clear of obstructions. In some labs the First Aid kit and Spill kit have been placed within the designated area to keep all emergency equipment in a central location.

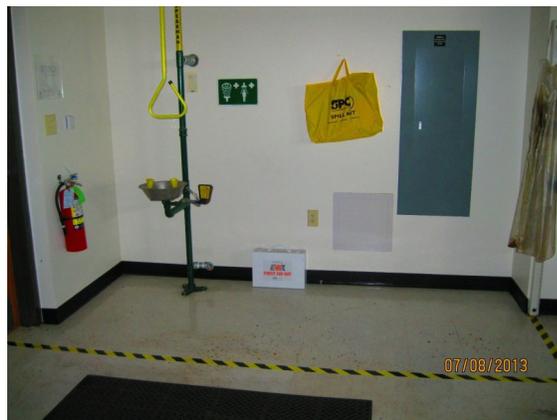
EH&S requests that clearance be maintained around this equipment, so please be mindful when placing items near the designated locations. Safety is everyone's responsibility! Thank you for your cooperation to help EH&S maintain a safe lab and working environment.

*Photo at right shows example of a taped off eye wash/shower area with electrical panel, fire extinguisher, Spill kit and First Aid kit located together in a lab.*



### Welcome Back Darren!

*Darren Byington returned to work on July 16 following a one year leave of absence while his National Guard unit was deployed to Afghanistan. Darren works in the Fire & Life Safety Program. We are glad to have him back safe and sound—our department definitely missed him while he was away!*



## EH&S Staff Members Rescue Duck Family

In May, EH&S assisted a mother duck when her babies became stranded in the fountain near Science Hall. Merja Karwoski discovered the little family. Rick Stell found a board to use as a ramp and steered the ducklings toward it so they could climb out of the fountain. Laura Warren helped get the ducklings into a box so they could be moved safely out of harm's way and back to a natural water area, with mother duck following closely behind. The group effort was successful! See more photos on our [Facebook page](#).



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# Biological Safety Cabinets: For Your Safety and Research Protection

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The primary purpose of a Biological Safety Cabinet (BSC) in a biolaboratory is to protect the laboratory worker and the surrounding environment from pathogens. Today's BSCs are highly effective at controlling and containing aerosols and some cabinet types can even contain volatile compounds. These cabinets are used to work with infectious microorganisms, research applications involving the use of sterile tissues, cell cultures, helping to maintain sterility of cell lines, along with efforts to minimize cross-contamination. In order to maximize the laboratory productivity while maintaining the highest level of safety, these cabinets have become a crucial component within laboratories.

The U.S. Centers for Disease Control and Prevention (CDC) classifies BSCs into three classes. These classes and the types of BSCs within them are distinguished in two ways: the level of personnel and environmental protection provided, and the level of product protection provided. The most commonly used BSCs are Class II cabinets due to their ability to offer protection to both the user and the sample(s) being worked with.

### CABINET TYPES

**Class I** - Biosafety Level 1-3: Suitable for working with moderate to severe potential hazards;  
–Protects personnel and environment, but no product/sample protection

**Class II** - Biosafety Level 1-3: Suitable for working with moderate to severe potential hazards;  
–Protects personnel, environment, and product/sample protection

**Class III** - Biosafety Level 3, 4: Suitable for working with severe, exotic, and dangerous potential hazards;  
–Provides personnel protection against highly infectious microbiological agents and hazardous materials. Maximum protection is provided for the environment and worker.

There are four types of Class II BSC (Table 1). Class II, Type A2 BSCs are the most commonly used cabinets in biosafety level (BSL) 1, 2, and 3 laboratories. Of the 54 BSCs currently in use at UT Arlington, 98% are Type A2 cabinets.

Type A2 BSCs are designed with higher inflow velocities of 100 ft/min to help control hazardous gases and vapors more effectively than Type A1 cabinets. Air is drawn from the front and rear grills under the work surface, up inside the rear wall and into the blower plenum. From this space, the contaminated air is pulled into either the down flow blower or the exhaust blower. Therefore, part of the air is exhausted into the laboratory and part is recirculated back into the BSC chamber. Type A2 BSCs can also be connected to a “thimble” duct or canopy hood, allowing use with minute quantities of volatile toxic chemicals and trace amounts of radionuclides (Picture 1).

Due to their ease of installation and reliable design, re-circulated Type A2 cabinets (see Picture 2) are recommended for particulate contamination and hazards including biological agents (viruses and bacteria) at BSLs 1, 2, and 3. However, the preferred choice when using minute quantities of toxic chemicals are the canopy connected Type A2 BSCs. BSCs can also be hard connected to the building exhaust system as seen in Picture 3.

**Table 1: The Types of Class II BSCs**

CABINET TYPE	EXHAUST	Work with volatile toxic chemicals and radionuclides
<b>Class II, Type A1</b>	HEPA-filtered BSC exhaust returned to the room	Not suitable
<b>Class II, Type A2</b>	HEPA-filtered BSC exhaust returned to the room	Not suitable
<b>Canopy connected, Class II, Type A2</b>	HEPA-filtered BSC exhaust air is completely exhausted through the canopy connection, and vented out of the building	Minute quantities allowed as an adjunct to microbiological studies
<b>Class II, Type B1</b>	HEPA-filtered BSC exhaust air is completely exhausted through the direct duct, and vented out of the building	Minute quantities allowed as an adjunct to microbiological studies
<b>Class II, Type B2</b>	HEPA-filtered BSC exhaust air is completely exhausted through the direct duct, and vented out of the building	Allowed as an adjunct to microbiological studies



**Picture 1:**  
*Canopy  
(thimble) unit  
for ducting a  
Class II,  
Type A BSC*

### CONTAMINATION CONTROL

Contamination is a major issue associated with all experimental procedures in biolaboratories. Contaminating microorganisms can be detrimental to important experimental data, furthermore, as the air is circulated, there is always the possibility of the user inhaling contaminants carried in it. It is also essential to prevent contamination of the air exhausted out of the building which can have potentially harmful effects on the environment.

### HEPA FILTERS

Control of airborne particles became possible with the development of high efficiency particulate air (HEPA) filters which can effectively remove microscopic contaminants from the air. The use of filters is critical in preventing the spread of airborne bacteria and viruses, and therefore in the prevention of infection. HEPA filter integrity must be certified after a BSC is initially installed and after it has been relocated.

### ULTRAVIOLET LIGHT

Ultraviolet (UV) lights, often regarded as biocidal devices, are a common accessory in many BSCs. The CDC does not recommend the installation of UV lamps in BSCs and the American Biological Safety Association supports this position. Even

when UV light is used for contamination control in BSC, work surfaces need to be decontaminated with an appropriate liquid decontaminant before beginning work and after completion of the experiment in a BSC.

### WORK PRACTICES

As with work on open bench tops, work performed within a BSC must be done carefully and safely. To avoid contamination and the risk of personnel exposure, the CDC advises investigators to follow best practices to reduce and control splatter and aerosol generation, such as keeping clean materials at least 12 inches (30 cm) from aerosol-generating activities and arranging the work flow "from clean to contaminated". It is advisable to avoid the use of open flames in a BSC because they can cause disruption of the airflow inside the cabinet, which jeopardizes the contaminate-free environment of the BSC.



**Picture 4:**  
*Certification  
Technician  
checking  
the air flow  
of a BSC*

### MAINTENANCE/SERVICE

BSCs need to be maintained in a regular pattern. During this check, the air flow (Picture 4) and the filter capacities are controlled. Filters have a limited life span. Depending on the lab environment and the type of samples, the filtered air flow-through is reduced over time. Recent cabinets measure the air flow-through constantly. If the flow-through is too low, there will be an alarm. Changing the filter needs to be limited to trained persons as the filter is potentially contaminated.

EH&S keeps an inventory of BSCs on the UT Arlington campus, monitors due dates, sends reminders to the principal investigators for the annual certifications, and maintains these records. Compliance with the safety guideline of annual certification for BSCs (and any new units purchased), repair maintenance, replacement parts and/or decontaminations of BSCs is the responsibility of the UT Arlington departments, including payment. EH&S needs to be notified at 817-272-2185 when any new BSCs have been purchased.

Keeping biological safety cabinets in good working order makes UT Arlington a safer place to work and learn!

**For more specific information about BSCs, please visit the EH&S [Biological Safety website](#) to view an expanded version of this article.**

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**Picture 2:**  
*Class II,  
Type A2  
BSCs at UT  
Arlington*

**Picture 3:**  
*Class II,  
Type A2  
BSCs hard  
connected  
to exhaust  
at UT Ar-  
lington*



Check out  
EH&S on  
Facebook  
to keep up  
with all our  
events &  
training:

[UT Arlington  
Environmental  
Health & Safety  
Office](#)

## Safe Outdoor Cooking Tips

Before you start your grill, make sure it is at least ten feet away from other objects, including your home and shrubs.

- Never leave your grill unattended while food is cooking.
- Do not use grills inside of buildings.
- Do not use grills in apartment complexes, except on the ground level. Keep them out from under overhangs or balconies.
- Keep children and pets away from cooking area.

### GAS GRILLS

- Before lighting a gas grill, check the connection between the propane tank and the fuel line to be sure it is working properly and not leaking.
- Never use a match to check for leaks. Use a leak-detection solution made from a teaspoon of mild liquid hand soap in a cup of water to check all connections for leaks. Bubbles at the connection indicate leakage. Rinse using clear water.
- If you detect a leak, immediately turn off the gas. Do not attempt to light the grill again until the leak is fixed.
- Move gas hoses as far away as possible from hot surfaces and dripping hot grease. If you cannot move the hoses, install a heat shield to protect them.



*EH&S celebrated the first day of summer on June 21 with a department cookout. Fire Housing Inspector Bruce O'Keefe served as our grill master.*

- Replace scratched or nicked connectors, which can eventually leak gas.

### CHARCOAL GRILLS

- Never use gasoline or other flammable liquids as a lighter fluid.
- Soak grilling ashes in water before discarding in the trash.
- Because charcoal produces carbon monoxide fumes, until the charcoal is completely extinguished do not store the grill indoors with freshly used coals.



## It's Summertime in Texas!

Remember to protect yourself from heat illness, especially if you do physical work outdoors.

Wear light-weight, light colored, loose-fitting clothes.

Drink plenty of fluids. Drink often and BEFORE you are thirsty. Drink water every 15 minutes.

Schedule frequent rest periods with water breaks in shaded or air conditioned areas.

See the [OSHA Quick Card](#) guide for more information.

## EH&S TRAINING COURSES

These courses can be accessed online at this website [www.uta.edu/training](http://www.uta.edu/training):

Lockout/Tagout

Confined Space Entry

Hearing Conservation Training

The following online courses are available at this website [www.uta.edu/ra/real/loginscreen](http://www.uta.edu/ra/real/loginscreen):

Hazard Communication Training

Radiation Awareness Training

Bloodborne Pathogens Training

Laser Safety Training

**Defensive Driving Course (DDC)** This course must be completed every 3 years to remain an authorized driver of UTA vehicles. Driving record checks (MVR) must be renewed annually.

**15-Passenger Van Training:** Take the online course first. A behind-the-wheel driving test is also required and will be conducted on the dates and times below. ***Class size is limited, so please call ext. 2-2185 to register ahead of time.*** Meet at the EH&S office, 500 Summit Ave. Drivers must have already taken the Defensive Driving Course and have a current driving record check to attend.

August 14 (W) 2:00 pm

Sept. 11 (W) 2:00 pm

Oct. 9 (W) 2:00 pm

August 27 (Tu) 10:00 am

Sept. 24 (Tu) 10:00 am

Oct. 22 (Tu) 10:00 am

Call us at ext. 2-2185 to schedule other required training available through our office, such as:

Radioactive Materials

Radiation Producing Machines

Hot Work Safety

Lift Truck

BioSafety Level II

Shipping Infectious Materials

Respirator

**Fire Extinguisher Training** will be provided to groups on request. Please call 2-2185 to schedule.



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