We have two themes for this issue of Safety Buzz: chemical safety and holiday safety. The articles will provide general guidance regarding safety, but, as always, we invite you to contact us directly for more detailed information. For my part, I will address a potentially insidious hazard that we might face during the winter—Carbon Monoxide.

Carbon monoxide is a colorless, odorless, and tasteless gas. It is a product of combustion of fossil fuels such as natural gas, fuel oil, propane, liquefied natural gas (LNG), gasoline, and kerosene. Carbon monoxide is a poison because the part of human blood that transports oxygen, hemoglobin, has a far greater affinity for carbon monoxide than oxygen. In situations where there are very high airborne concentrations of carbon monoxide, hemoglobin will carry so little oxygen that the exposed individual can be starved for oxygen. In urban environments during periods of high motor vehicle traffic, such as where Georgia Tech is located, the ambient level of carbon monoxide outdoors can reach 1 or 2 parts per million (ppm)—not a dangerous level. For workers, EH&S limits carbon monoxide exposure to 25 ppm over an 8 hour working day. Individuals can safely be exposed to higher levels for shorter times.

During the cold weather, we close the windows and turn on the heat—at home, in the car, and at work (if we work indoors). Furnaces that use combustion to produce heat also produce carbon monoxide that is supposed to go “up the chimney.” Heat pumps and electric heaters do not produce carbon monoxide because there is no combustion. Carbon monoxide can also enter motor vehicles if there is an exhaust system leak or some other problem with the car.

How do we protect ourselves from carbon monoxide poisoning? First and foremost, ensure that your furnace is maintained according to the manufacturer. Have it checked periodically to make sure that it is working normally. Make sure that the heat exchanger is checked and that it is not cracked. Ensure that the flue or chimney is not blocked. Modern furnaces have protective devices to check for proper operation and the “computer” will shut down the furnace if a “fault” is detected. However, these devices do not detect carbon monoxide so it is important to have the furnace inspected.

Second, make sure that your car exhaust system is intact, and be sure that the engine is maintained properly. Several years ago I tested a police car for carbon monoxide because police officers were falling asleep while on patrol. My test results showed very high carbon monoxide levels inside the police cars—this explained their drowsiness. A gasket on the engine exhaust recirculation system had failed and replacing this inexpensive part cured the problem.

Third, use fireplaces, gas stoves, propane grills, kerosene heaters, propane heaters, and radiant heaters properly. These devices can emit very high levels of carbon monoxide and/or can present a significant fire hazard. Refer to the manufacturer’s instructions for safe usage. Do NOT leave these devices operating unattended!

Lastly, install carbon monoxide detectors in your home. These are plug in devices available in hardware stores, department stores, and warehouse clubs.

cont’d on pg. 2
Holiday Food Safety

The holidays are a time to enjoy with family and friends. And one of the highlights of being with our friends and family is the wonderful foods which are prepared! Food safety should go hand in hand with food preparation. Remembering the proper handling methods can keep your meal enjoyable and safe.

Throughout food preparation and serving, the Partnership for Food Safety Education’s Fight BAC! ® Campaign advises consumers to:

**Clean**: Clean the food thermometer after use and use clean serving plates, utensils, etc. Consider using paper towels or clean cloth towels for your cleanup, since the average kitchen sponge harbors 7.2 billion bacteria!

**Separate**: Separate raw meat and poultry from cooked foods to avoid cross-contamination.

**Cook**: Raw meat and poultry need to be cooked thoroughly.

**Chill**: Store leftovers in the fridge within 2 hours of taking food out of the oven or off the stovetop.

When the food has cooked thoroughly, it’s time to eat. When serving up hot food buffet-style, remember:
- On a buffet table, hot foods should be kept at 140°F or higher. Keep food hot with chafing dishes, crock pots, and warming trays.
- Keep it all piping hot before serving. Before the party, place these foods in insulated thermal containers. Keep containers closed until party time.

After everyone has stuffed themselves silly, it’s time to properly store those leftovers. Make sure the prepared food is put into the fridge or freezer within two hours. It’s also helpful to divide large amounts of leftovers into shallow containers for quick cooling in the fridge. And, don’t over-stuff the fridge. Cold air must circulate to keep food safe.

If all of these food safety tips are followed, your holiday dinner will prove to be a wonderful occasion filled with good food and memories.

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### Safe-Cooking Temperature Chart

<table>
<thead>
<tr>
<th>Category</th>
<th>Temperature</th>
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| **Beef/Pork** | - Cook beef roasts and steaks to 145°F for medium rare or to 160°F for medium.  
- Cook ground beef to at least 160°F.  
- Cook raw sausage to 160°F.  
- Reheat ready-to-eat sausages to 165°F.  
Cook pork roasts, chops, or ground patties to 160°F, or 170°F for well done. |
| **Poultry** | - Cook whole poultry to 180°F.  
- Cook chicken breasts to 170°F.  
- Cook chicken leg to 175°F.  
- Cook stuffing to 165°F. |
| **Eggs** | - Cook eggs until the yolk and whites are firm.  
- Don’t use recipes in which eggs remain raw or only partially cooked. |
| **Fish** | - Cook fish until it’s opaque and flakes easily with a fork.  
- For food safety reasons, avoid eating uncooked oysters or shellfish. People with liver disorders or weakened immune systems are especially at risk for getting sick. |
| **Leftovers** | - When reheating leftovers, heat them thoroughly to at least 165°F. |

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From the Director, cont’d from pg 1…

- The EH&S website now features “ChemFacts.” This link directs you to information regarding some of common chemicals. Topics include:  
  - Ethidium Bromide Handling Procedures  
  - Safe Handling of Extremely & Highly Toxic Materials  
  - Safe Handling of Mercury & Mercury Compounds

Be safe out there,
Chematix™

By Marcia Kinstler

As part of Georgia Tech’s ongoing efforts to streamline processes, a new, comprehensive chemical management information system is being rolled out across the campus. The new full-spectrum system, called CHEMATIX™, enables users to effectively purchase, manage, inventory and dispose of chemicals at Georgia Tech.

The Web based tool provides end users with complete lifecycle chemical tracking; including inventory management, access to safety information, waste management capabilities, and even the integrated ability to procure chemicals. “CHEMATIX™ is important in that it helps ensure the safety of students, faculty, and staff by providing users with easy to use, efficient, end to end chemical management capabilities, from purchasing to disposal, as well as rapid access to integrated safety data,” said Marcia Kinstler, Implementation Project Director. “In addition, the system helps Georgia Tech to better meet State and Federal regulations pertaining to chemical management”.

To test the system’s inventory functionality, CHEMATIX™ pilots began in April in a few labs with small chemical inventories and expanded during May and June to include a few labs with medium to large inventories. The pilot locations were selected by COE, COS, GTRI and Facilities leadership. Pilot participants have expressed pleasant surprise with the ease of inventorying chemicals using the system. Use of bar code labels and scanners simplifies and speeds reconciliation, which lab personnel especially appreciate.

“In an effort to provide the highest level of customer service and support, chemistry students have been hired to conduct the initial inventory load into Chematix and bar code containers,” said Duane Slack, Chemical Hazards Management Information Specialist. Duane is providing ongoing support for Chematix during and after campus-wide implementation and assisting users in transitioning to the new system.

Additional information may be obtained by visiting the CHEMATIX™ website http://www.cmis.gatech.edu or by contacting Marcia Kinstler, marcia.kinstler@facilities.gatech.edu or (404)385-6965.

Office Decorations

By David Richmond

The leaves are changing, the temperature is supposedly dropping and the holiday season is fast approaching. Time to dig out the decorations and maybe buy new ones for this year. Before hanging the decorations there are a few things to think about and decorating the office safely is what this is all about.

Here are a few things to think about and check prior to putting up the decorations.

- Extension cords are easy to over load with holiday lights and other decorations. The best thing to do is not use them.
- Candles are a major source of fires this time of year. Policy prohibits the use of candles in GT buildings.
- Live Christmas trees are another leading cause of fire during the holiday season. These are also prohibited for use on campus. Artificial trees that are flame retardant should be used.
- Hanging lights on the tree or around the office? Double check the lights to make sure they are functioning correctly and that the wires are not worn or cracked.
- Paper and cloth decorations are highly flammable. Take care when hanging them to avoid heat sources that could ignite them. If the items aren't flame retardant consider getting a spray on flame retardant and treating them. An often overlooked heat source are lamps. Whether a floor or desk lamp, these items generate enough heat to ignite paper and cloth items, particularly those with halogen bulbs.

Got a question or need help with your fire safety issues? Contact us!

Toys for Tots

The EH&S department’s 2nd annual Toys for Tots campaign begins after the Thanksgiving holiday. Feel free to drop toys off in our office.
Get to know your chemicals!

Adapted from “Chemfacts” written by Debbie Wolfe-Lopez

Starting this issue, we will highlight a chemical that EH&S feels the faculty, staff, and students on Tech’s campus should be familiar with. These will be either highly dangerous chemicals, or ones that are widely used on campus, therefore, everyone should be aware of the characteristics and dangers. The first chemical we will discuss is mercury and mercury containing compounds.

Mercury is a liquid metal that is environmentally persistent and bioaccumulates in the food chain. It is present in both organic and inorganic forms. The inorganic form can be further divided into elemental mercury and mercuric salts. Organo-mercury consists of long and short alkyl and aryl compounds.

Elemental mercury evaporates at room temperature and reacts with many elements to form salts, amalgams, and organo-mercury compounds. A number of these compounds are considered “highly hazardous” by the US EPA (P list). All mercury containing waste is considered hazardous and requires special disposal considerations.

All forms of mercury are toxic. Mercury poisoning can result from inhalation, ingestion, injection and/or absorption through the skin. All forms of mercury penetrate the placental barrier and should be considered teratogenic and reproductive effectors. This means that pregnant women should be particularly cautious regarding exposure. The effects from exposure to excessive levels of airborne mercury or skin contact with mercury compounds may not be noticeable for months or years.

Eight hour exposure limits for mercury and mercury compounds, published by the American Conference of Governmental Industrial Hygienists are as follows:
- 0.01 mg/m³ for alkyl compounds
- 0.1 mg/m³ for aryl compounds
- 0.025 mg/m³ for elemental mercury & inorganic compounds.

(mg/m³ is milligrams of material per cubic meter of air)

A short term exposure limit (15 minutes exposures with exposures at least one hour apart and no more than four such exposures per day) exists for alkyl compounds at 0.03 mg/m³.

Before you purchase or start working with mercury or mercury compounds, call EH&S for a Hazard Assessment.

EH&S will
- Review the toxicological data for the material.
- Survey your work area.
- Review your SOPs for work with mercury/mercury containing compounds.
- Review the training records for all those in the lab.
- Test engineering controls as appropriate.
- Test safety equipment as appropriate.
- Provide recommendations for PPE.
- Determine if medical surveillance is needed.

TRAINING

EH&S provides safety training dealing with fire and life safety, chemical and laboratory safety, CPR, defensive driving, biological awareness, and bloodborne pathogen training. Please contact EH&S for more information.