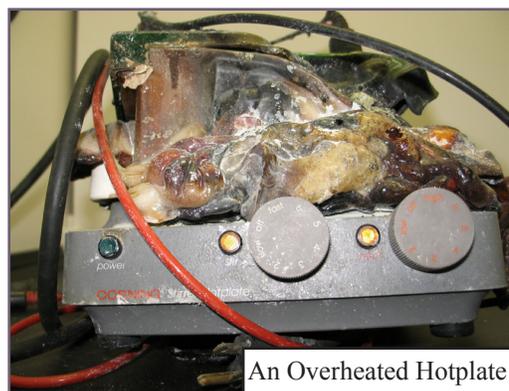


The Safety Issues of Hotplate Heating Controls



An Overheated Hotplate

Background

Spontaneous and unexpected heating of hotplates has been the cause of laboratory fires and explosions.

- In 2005, Lawrence Berkeley National Laboratory issued a safety advisory related to a Corning model PC 420 hot plate.
- In 2007, 2011, 2012, 2014 the University of California, University of Pennsylvania, MIT, and Oak Ridge National Lab issued similar safety advisories for Corning PC-35, PC-200, PC-220, PC-351, Fisher IsoTemp and the Thermolyne Model:SP46925.

Issues

- Hotplates manufactured from 1960s - 1980s may still be in active use. Hotplates in disrepair may be in use.
- **Older hotplates with relay heater switches can spontaneously heat in the heater dial OFF position.**
- Liquids in contact with electronics may cause shorts. Newer hotplates with TRI-AC or microprocessor-controlled heater switches may spontaneously heat in the OFF position due to liquid exposure to the electronics.
- Hotplate/stirrer combinations may be used when only stirring is required.
- Hotplate/stirrer combinations generally stay plugged in even when inactive.
- Temperature sensors may be misplaced, fall out or malfunction.

- Similarity of heating/stirring control dials and left/right reversal of control dials on hotplates from different manufacturers can lead to user errors.
- Users may not read user manuals.



Recommendations

- **Discard old hotplates through Emory Surplus.** Hotplates purchased prior to 1984 do not have temperature feedback controls. These models include the Corning PC-35 and PC-351 (pictured above) and the Thermolyne Model:SP46925.
- When only stirring is required, acquire and use a stirrer instead of a hotplate/stirrer combination.
- **Unplug inactive hotplates** or heating mantles in close proximity to oil baths, combustible or flammable material.
- Select hotplate housing designs that are less affected by spills and aggressive environments. **Where liquid spills can be anticipated (i.e. water cooled reflux) do not use hotplates that have open housing designs.**
- Look for hotplates with two independent temperature control circuits, which switch off heating in case of an over temperature situation.
- Make user manuals easily accessible.

References:

This article was adapted from the Northwestern University Office for Research Safety <http://www.research.northwestern.edu/ors/forms/CSHEMA%20Hot-plate%20Poster%202014.pdf>

Image Credits:

<http://www.ehrs.upenn.edu/programs/labsafety/alerts/hotplatefire.html>
<http://www.fvstore.com/Corning-PC-351-Ceramic-Top-Magnetic-Hotplate-Stirrer/p695378.html>

Training

Most EHSO Trainings are available online:

[EHSO Training](#)

[Rad Safety Training](#)

2nd Tuesdays at 10:00am (monthly).
[Lab Safety Training](#)
3rd Thursdays at 10:00am (monthly).

Chemical/ Radioactive Waste

[Full Schedule here...](#)

All **chemical** waste pick up should be requested by emailing chemwaste@emory.edu. All **radioactive** waste pick up should be requested via EHS Assist pick-up. **Chemical** waste disposal inventory form and/or **radioactive** waste inventory form should accompany all waste containers at the time of pick-up.

PPE

Choice to be based on potential exposures involved:

Eye: Glasses, goggles & face shields.

Gloves: Appropriate for the type of procedure.

Clothing: Gowns, lab coats, aprons, coveralls.

Respirators: Appropriate for the type of procedure.

Volunteers and Minors in the Lab

Summer is a great time for students to gain valuable laboratory or research experience through volunteering or internships. Working in a laboratory presents the risk of exposure to hazardous materials, which requires inexperienced lab personnel to receive training to help them identify the inherent hazards of experiments. EHSO has an established registration program to help investigators understand the University requirements associated with volunteers and minors working in the lab.

How does Emory Define “Minors”?

Any person who is less than 18 years of age AND who is not currently enrolled in an Emory University or Oxford College regular catalog course or degree program. Most high school students fall into this category.

How does Emory Define “Volunteers”?

Any person who offers a service or contributes knowledge and skills to the University without expectation of compensation. Volunteers are individuals 18 years or older that are not enrolled in Emory University or Oxford College in a degree seeking program or individuals that are not employed by the University (full-time or part-time).

Note: *Investigators at Yerkes should follow the specific process in place for volunteers and minors.* Contact Maureen Thompson for more information.

As an Investigator, What Steps do I Need to Follow?

1. Review applicable policy at policies.emory.edu & search for policy number in

the table below.

2. Register volunteer or minor with EHSO by completing and submit the applicable form listed in the table below.
 - *If you have questions about completing the form, please contact EHSO.*
 - Forms can be found at ehso.emory.edu/forms.
3. Request ELMS access for the minor or volunteer: Visit <http://www.emory.edu/elms-training/administrators>, log into the toolkit, and then click “request external learner” link.
4. Determine if amendment to your biosafety or chemical safety protocols is required.
 - Volunteers participating in research associated with a protocol will need to be added.
 - Minors participating in research cannot be added to a protocol.

Be Sure to Include/Complete:

- Start and End Dates for Periods of Research Activity.
- Required Trainings for the Volunteer or Minor.
- Vaccination Records (when appropriate).
- Signatures from the Investigator, Volunteer, or Parent of Minor.
- Amendments to Protocols.

Type	Registration Form	Policy
Minors	Minors Participating in Research Labs	7.21
Volunteers	Volunteer in Research Lab Registration Form	4.83

Signature Here

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Signature indicates: I have read and I understand the information in this issue of Lab Rat Newsletter. Use an additional sheet of paper for more signatures, if needed and attach to this document.

- This newsletter is a tool to help fulfill a legal requirement for ongoing safety training.
- Supervisors are responsible for ensuring that individuals in their area have read and understood the information that applies to their area.
- The signed newsletter should be placed into the PI’s EHSO Lab Safety Binder.

Eye Wash Testing

Eye wash stations should be tested and documented once a month by lab personnel.

Certifications

Certifications required annually:

- Biosafety Cabinets
- Geiger Meters
- Chemical Fume Hoods

Fire Extinguishers

Visual inspections of your fire extinguishes are conducted monthly:

A. Is it present and mounted in its proper location?

B. Is it readily accessible?

C. Initial and date attached tag.

If it appears to need servicing contact Campus Services at 7-7463

Tell us how we are doing!

The newsletter has a new home. Every individual article is now hosted [online!](#)

Got something to share? Send your comments to biosafe@emory.edu.

We look forward to reading your ideas and comments!

Building Liaisons

[Click here](#) to find your Radiation and Research liaisons.