

Environmental Health & Safety

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**ENVIRONMENTAL
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Autoclaves and Automated Equipment Washers

by Laszlo Virag, Research Safety Specialist

Autoclaves and automated equipment washers such as glassware washing machines are common appliances found throughout Columbia University's campuses. These units are operated by laboratory personnel on an as-needed basis or by dedicated, specially hired staff. Their operation may seem straightforward, however there are hazards associated with usage, including most commonly:

- ◆ **Heat burns** caused by autoclave chamber doors and by hot autoclaved materials;
- ◆ **Steam burns** due to residual steam being released from the autoclave chamber at the end of a cycle, especially if there is a technical malfunction;
- ◆ **Hot liquid scalds** from boiling liquid or a liquid spill in the autoclave chamber or automated equipment washer.



In addition to the above, bodily injuries may occur e.g., cuts caused by broken glass containers or improperly packaged/discarded sharp objects (surgical instruments, blades, needles etc.). Cleaning agents in glassware- or cage-washers are often caustic and/or corrosive, and can damage the skin.

EH&S performed a recent inventory of existing autoclaves and automated equipment washers across Columbia's campuses, and observed safety practices employed by the users. Following these surveys, EH&S developed a Standard Operating Procedure (SOP) and a specific safety training to provide hazard awareness and risk mitigation for operators of these units. The SOP will be posted on the EH&S website (<https://research.columbia.edu/content/environmental-health-safety>), and the training will soon be available both in a classroom setting and online through RASCAL.

EH&S reminds all operators that the rooms housing autoclaves and automated equipment washers are considered laboratory space and are subject to all general laboratory safety guidelines. Specifically, no food or beverages (eating and drinking) are allowed, and operators must wear appropriate lab attire (long pants or the equivalent/closed shoes) and personal protective equipment (laboratory coat, chemical resistant and/or thermal gloves, eye protection). For additional questions or concerns, reach out to labsafety@columbia.edu.

When working in the laboratory, eating, drinking or applying cosmetics is prohibited.

Proper work attire (long pants, closed toe shoes) and PPE (e.g., laboratory coat, gloves and eye protection) must be worn when working in the laboratory.

Remember to periodically flush your laboratory cup sinks and floor drains with water to prevent sewer gases from migrating into your laboratory.

Have you seen our new and improved website?

<https://research.columbia.edu/content/environmental-health-safety>

For Lab Fire Safety Prevention tips, check out FDN(wh)Y Me

<https://research.columbia.edu/content/fdnwhy-me>

Got Toxins? Serious Considerations for Select Agent Toxins

by Christopher Aston, Manager, Biological Safety Programs

Biological toxins are valuable research tools for studying biological processes. Certain biological toxins are deemed by the federal government to have the “potential to pose a severe threat to public health and safety”. These particular toxins are known as “Select Agent Toxins” and include tetrodotoxin, botulinum toxin, ricin, and Staphylococcal enterotoxins (for the full list see: <http://www.selectagents.gov/SelectAgentsandToxinsList.html>). Possession of such Select Agent Toxins, or nucleic acids that encode functional forms of the toxins, requires compliance with federal law and University policy. Research with some toxins is permitted without registering with the Federal Select Agent Program, provided the inventory of the toxin is maintained by each Principal Investigator (PI) below prescribed thresholds (see: <http://www.selectagents.gov/PermissibleToxinAmounts.html>). Toxins should be added to a PI’s Laboratory Assessment Tool for Chemical Hygiene (LATCH) and also to the ChemTracker system at the Morningside and Manhattanville campuses. To address the concern that someone might stockpile select agent toxins by receiving multiple orders below the excluded amount, institutional approval may be required for toxin purchases from companies such as Sigma. Please forward any declaration requests to biosafety@columbia.edu. Purchased toxins must not be distributed to other PIs or collaborators without EH&S approval. Recipient information, amount transferred, and declaration of legitimate need for the toxin must be documented. Use of any Select Agent in research requires submission of a hazardous materials appendix in RASCAL. A short awareness training course (TC4250) offered through the RASCAL Training Center module provides compliance information as well as how to submit RASCAL protocols for Select Agent Toxin research.

For the University to fulfil its “due diligence” obligation under the law, all Investigators possessing Select Agent Toxins are required to complete TC4250 training, and attest awareness of the regulations. If there are any questions or concerns, contact biosafety@columbia.edu for guidance.

Spring is Here: Proper Laboratory Attire is Important Year Round



Yes
Long pants
Closed toe
shoes



No
Shorts
Sandals/
Flip Flops

<https://research.columbia.edu/sites/default/files/content/EHS/Policies/PPEPolicy.pdf>

Goggle Boggled? Tips on Selecting Proper Laser Safety Eyewear

by Joshua Young, Health Physicist

There is a wide variety of unique laser systems in the field, so selection of proper laser safety eyewear can be a daunting task. Laser safety eyewear is specific for particular power outputs and wavelengths. Eyewear that is suitable for one laser system may not necessarily be appropriate for another. In order to determine which set of laser eyewear is needed for a particular laser system, refer to the calculated optical density (OD) in the laser system's specifications. The OD is a method of describing the ability of a lens to filter the intensity of incident light for a specific wavelength. Once known, the OD for the system's specific wavelength range can be matched to appropriate eyewear, which can be identified by a permanently printed mark on the lens or frame of the eyewear (for example, see right). Before choosing laser eyewear, always verify that it corresponds with the appropriate OD and wavelengths for the laboratory's specific operations.

When a laboratory utilizes multiple lasers of various wavelengths and power outputs, this may increase the hazard of a reflected beam from another user operating the other laser and complicate the choice of laser eyewear. A laser user should select eyewear that corresponds only to the laser system they are directly operating, as this is the greatest source of hazard. To protect against other laser beams in the room, use laser barriers to prevent a reflected laser beam from impacting a laboratory member that is operating a laser elsewhere in the room. Beneficially, each user then only has to be concerned about wearing eyewear specific to their particular system. The protection provided by laser eyewear and laser barriers works together to ensure every user's safety.



Finally, consider the laser system experiments and any beam manipulations that may be conducted. Experiments may introduce many complexities since OD can be altered by different factors including the beam path, and other parameters such as pulse duration, and repetition rate. This makes it difficult for manufacturers to recommend eyewear because they do not know the nature of a particular experiment. Environmental Health and Safety's Laser Safety Team can provide technical guidance and verify which laser safety eyewear is appropriate for your specific laboratory, email: lasersafety@columbia.edu for more information.

Spring Cleaning in the Laboratory

by Andrew Patterson, Senior Fire Safety Officer

Now that winter is winding down, it is time for “Spring Cleaning”- time to clean up and clear out laboratories, contiguous corridors, and hallways. Performing general housekeeping not only keeps these areas well-maintained but also clutter-free, and helps to ensure that adequate means of egress are clear in the event of an emergency evacuation.

The Fire Safety team reminds everyone of the following New York City Fire Code requirements:

- ◆ **Storage** - Storage of combustible materials in buildings should be orderly. Separate combustible materials by distance or shielding from heaters and other equipment that may expel heat so that materials do not ignite.
- ◆ **Ceiling clearance** - Storage shall be maintained 2 feet or more below the ceiling in areas of buildings not protected by a sprinkler system, or a minimum of 18 inches below sprinkler head deflectors in protected areas. Ensure that boxes, equipment, and other materials are not blocking the space close to the ceiling.
- ◆ **Means of egress** - Combustible materials shall not be stored in a manner that obstructs egress from any building, structure or premises. Keep hallways clear of tables, chairs, and other furniture that may block walkways or doors.

In addition, the New York City Building Code states that the minimum corridor width shall not be less than 44 inches in a hallway and 36 inches within a laboratory. University policy may have more stringent restrictions depending on a hazard analysis. For more information on assessing the state of your laboratory, email fire-life@columbia.edu. For assistance in discarding items cluttering your laboratory or hallway contact Facilities at 212-305-HELP (4357).

Daylight Savings is a Great Time to Check the Batteries in Your Household Smoke Detectors!

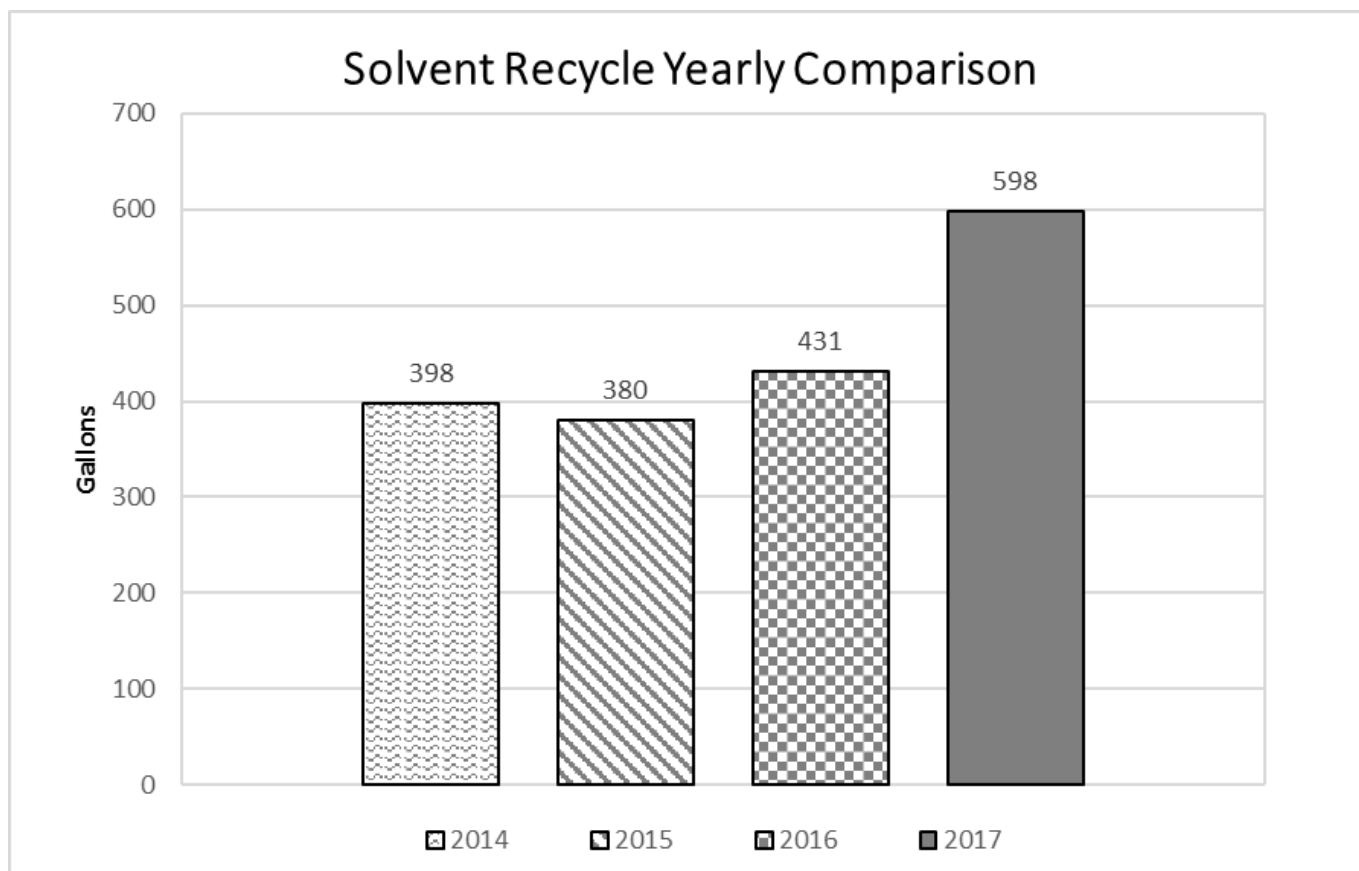


Solving the Problem

by Keith Bottom, Senior Hazardous Materials Specialist and Laboratory Sustainability Coordinator

Researchers throughout Columbia University have been doing their part to help Columbia “go green.” At the Morningside and Medical Center campuses, there is a program where large batches of solvents (acetone, xylene or ethanol) are being recycled for onsite re-use prior to final disposal. This reduces waste and cost to participating laboratories. Recycling can lengthen the life of the solvent by a range of three to five times.

To demonstrate the success of this program, the chart below illustrates the amount in gallons of solvent the Morningside campus has recycled from its laboratories. There has been a 50% increase in the yearly amount in gallons recycled from 2014 to 2017. Perhaps even more impressive, at the Medical Center campus, the Pathology and Dermatopathology groups have a dedicated recycling setup and recycle approximately 2,000 gallons annually!



This program is not only a benefit to the University, but to the environment. In addition to less waste, recycling solvents reduces emissions associated with offsite shipment and disposal. EH&S' website is updated in March with annual sustainability data, so look out for 2017 information on the [Recycling and Green Initiatives](#) page.

If your laboratory works with large volumes of either acetone, xylene or ethanol, you may be an ideal candidate for this no-cost program. Reach out to the Hazardous Materials Team to discuss all your questions about sustainability at hazmat@columbia.edu.

Spotlight on Safety – Safety Culture and Sustainability

by Delaney K. Jones, Health and Safety Specialist

Dr. Andrés Bendesky is a new Principal Investigator at the Jerome L. Greene Science Center on the Manhattanville Campus. His laboratory researches the mechanisms of behavioral variation from genetic and neurobiological angles: identifying specific genes involved in these processes and how they impact the brain, as well as characterizing functional variation in neuronal circuits. In turn, the group can then analyze the common themes that emerge to describe the evolution of behavior. Kerel Francis, Laboratory Manager, shares with EH&S Dr. Bendesky's positive approach to safety culture and sustainability efforts.

EH&S: Why is safety so important to you and the laboratory?

Kerel: Dr. Bendesky has a strong role in being attentive to the safety and sustainability practices in the laboratory. Being new to Columbia and also new to Dr. Bendesky's lab, it was a priority for me to start off with a positive safety culture from the beginning. We want everyone to feel comfortable in their work environment and for us to have the confidence that no one is going to get hurt. Also for the simple reason, we want everyone to make it home safely. We want to protect our lab members and the environment.

EH&S: What safety topics do you focus on in the laboratory?

Kerel: We want to make our lab a "green lab". We have been focusing on reducing waste, especially biomedical waste, by making conscientious decisions of properly disposing gloves that have minimal contamination, and saving products and solutions we may use in a month or two instead of disposing them. I thought this was going to be a challenge to remember, but EH&S has a lot of procedures in place and information available which made it easy to follow the guides.

EH&S: What does you laboratory perceive to be the biggest risk?

Kerel: Chemical waste disposal. People can be absent-minded about what chemicals can be mixed and where it is properly disposed. I encourage staff to look at the posted signs, and be familiar with product information, such as their interactions and other safety precautions. This is done easily by referring to our inventory's SDSs located in the Chemtracker system. One thing I have done personally is creating premade waste containers. This avoids container duplication and avoids waste compatibility confusion for our laboratory members.

EH&S: How else do you achieve risk mitigation for chemicals?

Kerel: When we use highly hazardous or toxic materials we minimize our contact by purchasing premade solution rather than making it ourselves. For example, if there is a solution we can purchase for finished protein gels, we can reduce potential exposure to acrylamide. We are always looking for ways to minimize or avoid contact with hazardous substances if it is an option.

EH&S would like to thank Kerel Francis and Andrés Bendesky for sharing their practical application of safety culture. EH&S can assist all laboratories in risk mitigation strategies as well as sustainability efforts. Reach out to labsafety@columbia.edu for more information.

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Please share questions or comments with us at newsfeedback@columbia.edu

Vision Statement

Environmental Health and Safety (EH&S) provides expert guidance and timely service to the University Community through our commitment to health and safety. Employing best practices and collaboration, and by building long term relationships, we promote a productive and safety conscious work environment.