
The Waste-Paper

“Waste is a terrible thing to mind”

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Used Oil: Not Hazardous Waste

Used oil is a class D Recyclable Material which has lesser regulatory requirements than hazardous chemical waste. Used oil is commonly generated in the laboratories; it is primarily generated from vacuum pump oil, lubricating oil, hydraulic oil, or compressor oil changes and clean-outs.

Storage containers of used oil must be labeled “Used oil.” Fines have been assessed for mislabeling used oil as “hazardous waste” or “waste oil” as well as for the lack of labeling. There are some conditions where the oil you are disposing does qualify as hazardous waste. For instance, oil mixed with a listed hazardous waste is considered hazardous waste, and oil that has toxic or corrosive characteristics is considered hazardous waste and should be managed accordingly.

Some examples of used oil regulated as class D recyclable material are:

- refined, coal, shale, synthetic oils
- used oil mixed with fuel if the resultant mixture is not flammable
- oil drained off solids
- solids if they contain free flowing oil

There is no regulatory restriction on the length of time, or how much used oil may be stored, but a Spill Prevention, Control and Countermeasure (SPCC) Plan is required for quantities greater than 1320 gallons. EHS encourages researchers to promptly bring containers of used oil to their monthly chemical waste collection.

Universal Waste

Universal wastes are hazardous waste streams that are widely generated and very common and thus are uniquely regulated by the EPA with special regulations to optimize collection and management. Examples of universal wastes are batteries, pesticides, lighting bulbs/lamps and spent electronics.

The requirements governing the management of Universal waste somewhat reduced when compared to fully regulated hazardous waste. As a large quantity generator of universal waste, Princeton University must:

- not dispose or treat universal waste (i.e., cannot place in trash or burn)
- not store more than 5,000kg (~11,000 lb.) of universal waste at any time
- prevent environmental contamination

- label Universal Waste or storage containers as required; e.g., “Universal Waste – Batteries”
- label the accumulation start date on the container or actual universal waste item
- not accumulate universal waste for longer than one year from the accumulation start date
- only ship universal waste to a licensed universal waste handler

University Building Services manage universal waste collection and shipping. Laboratories and shops can assist in the university’s compliance effort by accurately assessing their waste and managing it in accordance with university guidelines. Contact EHS (8-5294) with questions about universal waste management.

Used Battery Disposal

Many labs have equipment that runs directly from battery power or use batteries as a backup source of energy in the event of a power failure. Many of these batteries contain heavy metals and therefore must be managed in a safe and environmentally sustainable manner. The EPA regulates used batteries as *universal waste*.

The following is a quick guide listing some common batteries and the proper methods of disposal.

Alkaline Batteries – general lab waste (trash)

Alkaline batteries are not rechargeable and do not contain any regulated hazardous materials. From a life cycle and energy analysis standpoint, recycling an alkaline battery is more environmentally detrimental than disposing of it directly in the trash. Princeton University follows this guideline and does not recycle alkaline batteries. Please help our Building Services staff and refrain from placing alkaline batteries in the recycling pails.

The following batteries are collected for recycling and are prohibited from disposal in the general trash due to the presence of hazardous chemicals.

Building Services provides collection containers (shown above) in research buildings throughout campus for collecting batteries approved for recycling. To prevent short-circuits and potential fire hazard during storage and



transport, battery terminals must be taped-over prior to placing the battery into the receptacle.

Lithium Batteries



Lithium batteries are typically non-rechargeable and contain lithium, a water reactive alkali metal. They are commonly known as “button cell” batteries due to their small size. They are commonly found in watches, laser pointers, computer motherboards, and other electronic devices that require a power source of small size.

Nickel/Metal Hydride (Ni-MH) Batteries

Ni-MH Batteries contain a NiOOH positive electrode and a water reactive, metal alloy forming the negative electrode. Batteries of this type are rechargeable and available in sizes similar to alkaline batteries (size AAA, AA, C, and D). They can be identified by the markings “RECHARGEABLE” OR “Ni-MH”.



Mercury and Silver Oxide Batteries

Non-rechargeable batteries similar in appearance to the lithium button cell batteries mentioned above. Mercury and silver are toxic metals regulated as hazardous waste that should never be disposed in the trash. Although this type of battery is becoming increasingly rare, it may still be found in older equipment.

Nickel-Cadmium (Ni-Cad) Batteries

Ni-Cad batteries are a very common rechargeable battery found in many devices most commonly in cordless power tools. The presence of cadmium, a toxic metal, requires this battery to be recycled. Ni-Cad batteries are available in a host of sizes from large rectangular devices to smaller sizes akin to alkaline batteries.



Lithium-Ion Batteries



Lithium-ion batteries are most commonly found in devices that drain a significant amount of power quickly such as cameras, cordless power tools and most commonly, laptop computers. They come in sizes similar to that of Ni-Cad batteries. A number of these batteries manufactured by Sony in Dell, Sony, Apple, Lenovo, Panasonic, Toshiba and Sharp laptop computers have been recalled in the past due to possibility of a dangerous short circuit causing the units to become unstable, and poses risk of explosion. Though there is some public debate, the journal *Environmental Science and Technology* found that there is enough lead in most lithium-ion batteries to classify them as hazardous waste; these batteries must be recycled as universal waste.

Lead-Sulfuric Acid Batteries

Lead-acid batteries are commonly known as car batteries. They contain both a toxic heavy metal (lead) and corrosive liquid (sulfuric acid), both of which are hazardous materials. Smaller versions of this battery are often found in uninterruptable power supplies (UPS) and emergency lighting systems. They are rechargeable but have a lifespan of 3-5 years. Due to their size, these batteries are not collected in the containers as shown above, but rather large blue plastic drums. Collection drums are located in the following areas: Engineering Quadrangle loading dock, Lewis Thomas Lab room R032 (accessible by Mike Fredericks), Carl Icahn Lab loading dock (accessible by Deb Grant), Jadwin Hall room A01, and Frick Chemistry stockroom.



For more information about recycling batteries, contact EHS (8-5294) or see the EHS website battery recycling webpage.

<http://web.princeton.edu/sites/ehs/chemwaste/battery.htm>

EHS HAZARDOUS WASTE CONTACTS	
Main Office	8-5294
Kyle Angjelo (Chemical Waste)	8-2711
Sue Dupre (Radioactive Waste)	8-6252
Jackie Wagner (Biohazardous Waste)	8-1427
Tom Drexel (Waste Paper)	8-6255
EHS Web Page http://www.princeton.edu/ehs	

This Month's Waste Disposal Drop Off: Wednesday, February 25, 2015

Lewis Thomas loading dock

- Collection room open from 2:00 - 4:00 PM
- Coordinators: [Michael Fredericks](#) (8-1351) for Molecular Biology and Psychology and [Bob Koenigsmark](#) (8-4123) for Geosciences

Jadwin Loading Dock Receiving Building

- Coordinators: [Philip Fairall](#) (8-3913) for Chemistry and [Jim Kukon](#) (8-4364) for Physics

E-Quad Room 7 (E-Quad and Bowen)

- Collection room open from 2:00 - 3:00 PM
- Coordinators: [Joe Laskow](#) (8-4739) or [Phil Curry](#) or [Anthony Schulz](#) (8-4563)

Hoyt, 185 Nassau

- Waste is collected upon request
- Contact [Kyle Angjelo](#) for pickup (8-2711)