

University of Puerto Rico
Mayaguez Campus
ADMINISTRATIVE BOARD

CERTIFICATION NUMBER 15-16-027

The secretary of the Administrative Board, of the University of Puerto Rico at Mayaguez Campus **CERTIFIES** that in an ordinary meeting held on Thursday, August 13, 2015, this Board **APPROVED** the following document:

UPRM LABORATORY MANAGEMENT PLAN

And for the record this certification, contained on these pages, is issued and remitted under the seal of the Mayaguez Campus, of the University of Puerto Rico, to the corresponding university authorities.

Given in Mayaguez, Puerto Rico, at the seventeen days of the month of August, two thousand fifteen.

Judith Ramírez Valentín
Judith Ramírez Valentín
Secretary

nep

Enclosures



Table of Contents

1. Introduction and Applicability of the Regulation	3
2. Definitions.....	4
3. Part I: Enforceable Requirements.....	6
3.1 Container Labeling.....	6
3.2 Method of Removal of Unwanted Material	7
4. Part II – Non-enforceable Requirements (Best Management Practices)	8
Best Management Practices (BMP).....	8
4.1 Container Labeling and Management.....	8
4.2 Training for Laboratory Workers.....	11
4.3 Training for Trained Professionals.....	12
4.4 Removing Unwanted Materials from the Laboratory	12
4.5 Making Hazardous Waste Determination	13
4.6 Laboratory Clean Out Procedures	13
4.7 Emergency Prevention	14
Appendix A	15
Appendix B.....	22

Handwritten initials

1. Introduction and Applicability of the Regulation

The purpose of this Laboratory Management Plan (LMP) is to standardize the management of materials discarded at the laboratories of the University of Puerto Rico at Mayaguez (UPRM) and that are regulated under the Resource Conservation and Recovery Act (RCRA) in accordance with the regulation provided by the Environmental Protection Agency (EPA) in 40 CFR 262 Subpart K. Subpart K establishes an alternate process for academic institutions to manage their hazardous wastes. This process differs from the one originally established by RCRA for the industrial generators of hazardous waste.

Subpart K allows more flexibility to eligible academic entities in certain areas that are unique to their operation. The Environmental Protection Agency (EPA) has determined that any institution (college or University) who wants to opt into subpart K MUST meet the following definition:

- “A private or public, post-secondary, degree-granting, academic institution, that is accredited by an accrediting agency listed annually by the U.S. Department of Education.”

The UPRM is an eligible academic entity under this definition and therefore can manage its hazardous wastes pursuant to Subpart K. After careful evaluation the UPRM has decided to modify the management process of its hazardous wastes to comply with this alternate set of regulations.

The following figure illustrates what IS and what IS NOT a laboratory under Subpart K and which UPRM laboratories will be subject to Subpart K requirements:


What IS a laboratory under Subpart K?			UPRM
Teaching and research labs	✓		✓
Art studios	✓		
Photo labs	✓		
Field labs	✓		
Diagnostic labs in teaching hospitals	✓		
Areas that support labs (e.g. chemical stockrooms, prep rooms)	✓		✓
Chemical stockrooms that do not support labs		✓	
Vehicle maintenance areas		✓	
Machine shops		✓	
Print shops		✓	
Commercial photo processing		✓	
Power plants		✓	


This LMP has been developed in accordance with the Subpart K requirements. It delineates the management of all regulated materials generated in laboratories (educational and research) within the premises of the UPRM main campus in the Municipality of Mayagüez.



. Definitions

1. **CENTRAL ACCUMULATION AREA** means an on-site hazardous waste accumulation area subject to either 40 CFR § 262.34(a) of this part (large quantity generators); or 40 CFR § 262.34(d)–(f) of this part (small quantity generators). A central accumulation area at an eligible academic entity that chooses to be subject to this subpart must also comply with 40 CFR § 262.211 when accumulating unwanted material and/or hazardous waste.
2. **COLLEGE/UNIVERSITY** means a private or public, post-secondary, degree-granting, academic institution, that is accredited by an accrediting agency listed annually by the U.S. Department of Education.
3. **ELIGIBLE ACADEMIC ENTITY** means a college or university, or a non-profit research institute that is owned by or has a formal written affiliation agreement with a college or university, or a teaching hospital that is owned by or has a formal written affiliation agreement with a college or university. Formal written affiliation agreement for a non-profit research institute means a written document that establishes a relationship between institutions for the purposes of research and/or education and is signed by authorized representatives, as defined by 40 CFR § 260.10, from each institution. A relationship on a project-by-project or grant-by-grant basis is not considered a formal written affiliation agreement. A formal written affiliation agreement for a teaching hospital means a master affiliation agreement and program letter of agreement, as defined by the Accreditation Council for Graduate Medical Education, with an accredited medical program or medical school.
4. **LABORATORY** means an area owned by an eligible academic entity where relatively small quantities of chemicals and other substances are used on a nonproduction basis for teaching or research (or diagnostic purposes at a teaching hospital) and are stored and used in containers that are easily manipulated by one person. Photo laboratories, art studios, and field laboratories are considered laboratories. Areas such as chemical stockrooms and preparatory laboratories that provide a support function to teaching or research laboratories (or diagnostic laboratories at teaching hospitals) are also considered laboratories.

- 
5. LABORATORY CLEAN-OUT means an evaluation of the inventory of chemicals and other materials in a laboratory that are no longer needed or that have expired and the subsequent removal of those chemicals or other unwanted materials from the laboratory. A cleanout may occur for several reasons. It may be on a routine basis (e.g., at the end of a semester or academic year) or as a result of a renovation, relocation, or change in laboratory supervisor/ occupant. A regularly scheduled removal of unwanted material as required by 40 CFR § 262.208 does not qualify as a laboratory clean-out.
 6. LABORATORY WORKER means a person who handles chemicals and/or unwanted material in a laboratory and may include, but is not limited to, faculty, staff, post-doctoral fellows, interns, researchers, technicians, supervisors/managers, and principal investigators. A person does not need to be paid or otherwise compensated for his/her work in the laboratory to be considered a laboratory worker. Undergraduate and graduate students in a supervised classroom setting are not laboratory workers.
 7. NON-PROFIT RESEARCH INSTITUTE means an organization that conducts research as its primary function and files as a nonprofit organization under the tax code of 26 U.S.C. 501(c)(3).
 8. REACTIVE ACUTELY HAZARDOUS UNWANTED MATERIAL means an unwanted material that is one of the acutely hazardous commercial chemical products listed in § 261.33(e) for reactivity.
 9. TRAINED PROFESSIONAL means a person who has completed the applicable RCRA training requirements of 40 CFR § 265.16 for large quantity generators, or is knowledgeable about normal operations and emergencies in accordance with 40 CFR § 262.34(d)(5)(iii) for small quantity generators and conditionally exempt small quantity generators. A trained professional may be an employee of the eligible academic entity or may be a contractor or vendor who meets the requisite training requirements.
 10. UNWANTED MATERIAL means any chemical, mixtures of chemicals, products of experiments or other material from a laboratory that is no longer needed, wanted or usable in the laboratory and that is destined for hazardous waste determination by a trained professional. Unwanted materials include reactive acutely hazardous unwanted materials and materials that may eventually be determined not to be solid waste pursuant to 40 CFR § 261.2, or a hazardous waste pursuant to 40 CFR § 261.3. If an eligible academic entity elects to use another equally effective term in lieu of “unwanted material,” as allowed by 40 CFR § 262.206(a)(1)(i), the equally effective term has the same meaning and is subject to the same requirements as “unwanted material” under this subpart.

- 
11. WORKING CONTAINER means a small container (i.e., two gallons or less) that is in use at a laboratory bench, hood, or other work station, to collect unwanted material from a laboratory experiment or procedure.
 12. CHEMATIX is a chemical management software, capable of tracking chemicals from point of entry as inventory to point of exit as waste, as well as every point in between, providing a robust environment in which to track substances and maintain compliance with all governmental regulations.

3. Part I: Enforceable Requirements

3.1 Container Labeling

This section will explain the basic requirements for labeling containers used to store unwanted materials in the laboratories. The requirements established in this section are compulsory and must be applied in all academic departments.

Please refer to Section 2.10 for the definition of UNWANTED MATERIAL. UPRM has decided to include in this definition of unwanted materials all chemical substances that are expired, used, or generated due to experiments unless determined otherwise by the laboratory worker, or until a formal determination is performed by the UPRM Environmental, Health and Safety Office (Oficina de Salud y Seguridad Ocupacional y Ambiental, OSSOA).


All containers use to store unwanted materials MUST be labeled. At a minimum they will contain the following information:

- The words "Unwanted Material"
- Contents of the container (chemical materials in the container and quantity)
- Accumulation start date

UNWANTED

It will be the responsibility of the laboratory worker within the laboratory to prepare the label and verify that labels are placed on all containers of unwanted material stored in the laboratory. Containers will not be removed from a laboratory unless the Chematix label is attached to the container.

3.2 Method of Removal of Unwanted Material



Unwanted materials will be removed from the laboratory using a rolling 6 months approach, that is, each container will be removed within 6 months from the container's accumulation start date. OSSOA personnel will remove unwanted materials from a laboratory after the laboratory places a request for removal through the Chematix system. Concurrently Chematix will be used to monitor whether removal of unwanted materials from a laboratory may be necessary. Furthermore a laboratory will not accumulate more than 55 gallons of unwanted materials. It is the laboratory's responsibility to comply with all OSSOA requirements, including appropriate labeling, use of correct containers, and notification time.

If a laboratory accumulates a total volume of unwanted material in excess of 55 gallons, all containers of unwanted material in the laboratory:

- Will be removed from the laboratory within 10 calendar days of the date that 55 gallons was exceeded.

If a laboratory accumulates more than 1 quart of any of the 6 P-listed reactive acutely hazardous unwanted materials, all containers of reactive acutely hazardous unwanted material:

- Will be removed from the laboratory within 10 calendar days of the date that 1 quart was exceeded.
- To ensure compliance with this requirement, the 6 P-listed reactive acutely hazardous unwanted materials are:
 - P006 – Aluminum phosphide
 - P009 – Ammonium picrate
 - P065 – Mercury fulminate
 - P081 - Nitroglycerine
 - P112 - Tetranitromethane
 - P122 – Zinc phosphide (> 10%)

Laboratories that generate more than 55 gallons of unwanted materials or 1 quart of reactive acutely unwanted materials will need to request removal of the waste from the laboratory at the moment that the 55 gallons or 1 quart volume of unwanted material is reached. The laboratory worker assigned to each generation point will be responsible to comply with all requirements established by OSSOA.

Once the unwanted materials are removed from the laboratory by a trained professional, the hazardous wastes determination will be made on the Central Accumulation Area (CAA) within four days of the unwanted materials arriving at this location. All RCRA applicable requirements for small quantity generators including those on 40 CFR 262.34(d), 262.34(f) and 40 CFR 265 Subpart I will be observed in the CAA.

The removal of unwanted materials from a laboratory is different from a laboratory clean-out procedure. The clean-out process can only be implemented once a year per laboratory or generation area. Refer to Section 4.2.2 for Laboratory Clean Out Process.

4. Part II – Non-enforceable Requirements (Best Management Practices)

Best Management Practices (BMP)

This section of the document will discuss the Best Management Practices that will be applicable to all areas that generate unwanted material. The selection, implementation, and inspection of these BMPs will be the primary responsibility of the area generating the unwanted material. OSSOA will provide technical support and assistance to the areas.

4.1 Container Labeling and Management

Chematrix generated labels will be used to identify containers holding unwanted materials. This will allow for a uniform system of identification throughout the four academic faculties in the UPRM (e.g. Agricultural Sciences, Arts and Sciences, Business Administration and Engineering) that may have laboratories generating unwanted materials. The Chematrix label will contain the following information:


- The words “Unwanted Material”
- A barcode to track the container
- Accumulation start date
- General information about the laboratory generating the unwanted material (person generating the material, department, building, room number, phone number)
- Chemical name(s), CAS number(s)
- Container size or content

If a Chematrix label is not available, the laboratory that is generating the unwanted material would have the following approved temporary options:

- a) Use the original manufacturer label. This label is located in the original container. However it is important to clarify that it can only be used as an alternate label if it is in good conditions. Good condition means that is clearly readable, not broken or missing information. The laboratory worker must add the word Unwanted Material to the container and the

accumulation start date. This is NOT an approved option if any chemical materials other than the ones stated on the original label are stored in the container.

b) The Laboratory could generate an alternate label that includes the following information:

- 
- i. Chemical Name
 - ii. CAS Number
 - iii. Laboratory generating the unwanted material (department, room number)
 - iv. Accumulation start date
 - v. The words "Unwanted Material"
 - vi. Any additional information required by the Environmental, Health and Occupational Safety Office (*Oficina de Salud, Seguridad Ocupacional y Ambiental [OSSOA]*).


Although there are temporary alternatives for labeling containers, these shall be viewed as a last resort. The preferred labeling system for containers holding unwanted materials is the label generated by Chematix. The alternate label can only be used during storage in the laboratory. Containers will not be removed from a laboratory unless the Chematix label is attached to the container.

The selection of the containers used to hold unwanted materials will be based on the hazardous characteristic of the unwanted material. The requirements of the containers are established by the Department of Transportation (DOT).

Two distinct classes of containers will be used in the laboratory to hold unwanted materials, working and non-working containers. Working containers are defined as: "small containers (i.e., two gallons or less) that are in use at a laboratory bench, hood, or other work station, to collect unwanted material from a laboratory experiment or procedure. Working containers may remain open until the end of the procedure or shift. Non-working containers are those into which unwanted materials will be deposited and will remain closed except when adding or removing unwanted materials. Working containers will not exceed one (1) gallon while non-working containers shall not exceed the five (5) gallon mark.

For the safe and suitable handling of all unwanted materials, but especially of the potentially hazardous unwanted materials that are generated in the laboratories, it is essential to select the appropriate containers. The following provides guidelines for the appropriate selection of containers to be used for the handling of unwanted materials at the laboratories:

- The most appropriate container for the different types of unwanted materials should be used.
- Separate containers for non-hazardous unwanted materials, biomedical, and radioactive waste mixtures, among others should be used.
- Separate containers for liquids, solids, and gases should be used.
- Containers that is compatible with the properties of the materials to be contained, considering possible secondary reactions should be used.

- 
- Plastic and glass containers should be used for unwanted materials handling. These can either be new or reused containers of chemical substances used in the laboratories. Containers must be clean and free of polluting agents, and must have their original cap.
 - Plastic containers should be made of polyethylene (HDPE or LDPE), polypropylene, polystyrene (PET), polymers of vinyl, or TEFLON, such as polytetrafluorethylene (PTFE) and fluorinated ethylene propylene (FEP).
 - Glass containers of chemical substances can be reused (i.e. soda lime) or glasswork made especially for laboratory use by known brands, such as Pyrex, Kimax, Corning, and Kimble.
 - Glass non-working containers for liquid unwanted materials can range in size from 500 ml up to 3.78 L (1 gallon). Preferably, 2.5 liters and 1 gallon containers must have an ear-like handle. The use of glass containers with a capacity superior to 1 gallon will not be allowed.
 - Plastic non-working containers for liquid unwanted materials can range in size from 500 ml up to 5 gallons. Containers with a capacity that surpasses 5 gallons will only be allowed in those laboratories where the volume of 5 gallons is attained in 5 days
 - Plastic or glass containers for solid unwanted materials can range in size from 250 g up to 2.2 Kg (5 pounds). The use of containers with a capacity that exceeds 2.2 Kg (5 pounds) will not be allowed.
 - Metal containers should never be used for corrosive or aqueous unwanted materials. These metal containers will not be used as secondary containments for liquid wastes.
 - Polyethylene containers must not be used for chlorinated solvents.
 - Use separate containers for unwanted materials that can be recycled or that can easily be treated in the laboratory (for example: basic neutralization of acids and strong bases) to prevent excessive waste generation.

Please refer to Appendix A for suggested glass and plastic containers.


OSSOA will provide technical guidance and assistance to all areas. Prior to their removal from the laboratory these containers must be clean and properly labeled in accordance with section 3.1. Labels that are not in good condition should be replaced.

All non-working containers holding unwanted material in liquid form will be kept in a designated area in the laboratory. In addition the cabinets used to store chemicals must be classified in accordance with their chemical properties. Incompatible chemicals will be stored separately to prevent any chemical reaction. In the selection and acquisition of chemical storage cabinets, their characteristics must be considered.

Please refer to Appendix B for tips regarding the proper handling of unwanted material containers, ranging from waste characterization to inspection.

4.2 Training for Laboratory Workers

All laboratory workers must be trained. The following personnel may be classified as Laboratory Workers:



Position
Laboratory Assistant
Laboratory Technician
Research Associate
Laboratory Technician I
Educational Laboratory Coordinator
Principal Investigator
Teacher Assistant
Student working at research laboratory

*This is just a partial list for reference purposes only.


Different methods will be used in the development and deployment of the laboratory workers' training program. The training schedule and content will be prepared by the Environmental Management System (EMS) Office. The main training method for laboratory workers will be classroom training. However, other options could be acceptable to comply with this requisite subject to prior approval by OSSOA and EMS Office. All laboratory workers must be certified. In order to be certified laboratory workers must complete a training session which will be offered initially at the beginning of each semester and will be effective for one academic year. The departments are responsible for coordinating the training for their laboratory workers every semester. The first training of the semester will be classroom based. For those laboratory workers unable to attend classroom training, web based training will be available.

Laboratory personnel working in a supervised teaching environment (i.e. undergraduate or graduate students) will be familiarized with the requirements contained in this LMP. Laboratory personnel working in an unsupervised, research setting (i.e. undergraduate or graduate students, researchers, non-teaching employees, faculty) will receive a more detailed and rigorous training. Training records will be kept by the EMS Office.

4.3 Training for Trained Professionals

Both to comply with the requirements of Subpart K and to ensure the safe on-site transfers on unwanted materials, trained professionals will:

- Accompany the transfer of unwanted material when it is removed from the laboratory either for consolidation in another laboratory or chemical stockroom, or taken to the CAA, and
- Make the hazardous waste determination, pursuant to §262.11, for unwanted materials



UPRM personnel from the OSSOA and EMS offices already receive training in RCRA and other regulatory requirements. Training will continually be refreshed and expanded as necessary. Training is often classroom based although other methods such as video training and in-person training are also used.

4.4 Removing Unwanted Materials from the Laboratory

As previously mentioned, the principal method to remove unwanted material from the laboratory will be time based, using a 6 month rolling approach. (Refer to Section 3.3)

To ensure that a container does not exceed the six month limit in the laboratory, a Chematix generated label including the accumulation start date will be required. Having this information in the system will also allow for the time a container of unwanted material remains in a laboratory to be monitored. Once the container is nearing its six time limit in the laboratory or is ready to be picked up, a pick-up worksheet will be created and submitted by the laboratory worker in Chematix and received by the trained professional in the OSSOA office. Then the trained professional will proceed to transfer the container from the laboratory to the CAA and make the hazardous waste determination.

If the 55 gallon of unwanted material or one quart of acutely reactive unwanted material volume limit is reached in the laboratory, the laboratory worker will create and submit a pick-up worksheet in Chematix and contact OSSOA or EMS personnel to alert them of the volume being exceeded. OSSOA personnel will assign priority status to the laboratory to ensure that the unwanted materials are removed within ten calendar days.

OSSOA promotes consolidation of compatible unwanted materials, allowing containers to be reused whenever possible. The label of the consolidation container must reflect its contents and the earliest accumulation date of the generated substance.

Only trained professionals may transfer unwanted materials between laboratories or from a laboratory to a chemical stock room for consolidation. Areas consolidating unwanted materials will be subjected to the Subpart K requirements, including the time and volume limits.

4.5 Making Hazardous Waste Determination

Unwanted materials will be moved only by OSSOA authorized personnel to the Central Accumulation Area (CAA). Once the unwanted material is moved to the CAA, the hazardous waste determination will be made within four days of the material arriving at the CAA. Within this four day time frame, OSSOA personnel can determine that the material is eligible for re-use, recycling or will be handled as a non-hazardous waste. After the hazardous waste determination is made, all applicable requirements in the CAA will continue to apply and be observed as usual.

Unwanted materials removed from the laboratories to the CAA must be identified with its removal date.

4.6 Laboratory Clean Out Procedures

Performing a Laboratory Clean Out procedure is NOT mandatory and will be directly influenced by the availability of funding to carry out a clean out. OSSOA will evaluate the laboratory inventory of chemicals and other materials which are no longer needed or that have expired, in order to determine the subsequent removal of those chemicals or other unwanted materials. Conducting a clean out will be considered for one of the following reasons, it may be on a routine basis (e.g., at the end of a semester or academic year) or as a result of a renovation, relocation, or change in laboratory supervisor/ occupant.

The clean out process allows for the redistribution of the chemicals. If a laboratory worker makes a determination that a chemical can be used in another laboratory, it would be considered a product and thus not regulated under RCRA. However, if such determination is **made after it is removed from the laboratory**, the clean-out chemical would be regulated as an unwanted material until it is redistributed from the CAA to another laboratory for further use


The laboratory clean out process allows the disposal or redistribution of chemical products in a 30 calendar day period. Once a clean out has been declared, waste resulting from unused commercial chemical products will not be counted toward generator status. Generator status will not be affected by the volume of waste generated during this process. The 30 day period will start when OSSOA personnel in coordination with laboratory personnel begin sorting through and evaluating the inventory of laboratory chemicals, making the corresponding unwanted materials determination. This process will be lead by OSSOA personnel which will develop the clean out schedule.

Clean outs will only be performed once every twelve (12) months per laboratory. At the conclusion of the laboratory clean-out, all unwanted materials must be removed from the laboratory.

All records pertaining to a laboratory clean-out including the laboratory being cleaned out, the date the laboratory clean-out begins and ends, and the volume of hazardous waste generated during the laboratory clean-out will be kept in the OSSOA office. These records will be maintained for a period of three years from the date the clean-out ends.

4.7 Emergency Prevention

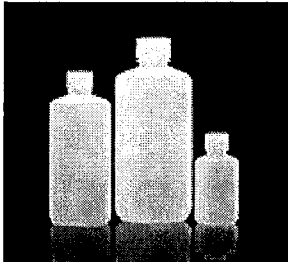
To ensure a quick response in case of an emergency occurring in a UPRM laboratory, emergency contact information will be posted in every laboratory near the laboratory phone. This list will include contact information for both emergency responders on campus and off campus. Evacuation routes will also be posted in every laboratory.



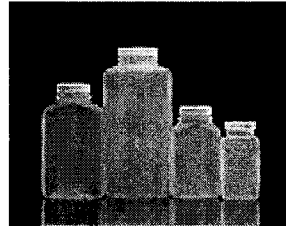
An inventory of all chemical materials in UPRM laboratories is kept in Chematix. This information is continually being updated and is available to campus administrators and emergency responders through the EMS office. Chemicals that might become dangerous over time, such as peroxide formers, are assigned a one year expiration date from the date they are first added to the inventory. Once the year time limit is reached, the system will require the user to visually inspect the material, and allows for a one-year extension of the expiration date only if the container and content are in good condition. If either the container or content show signs of deterioration the laboratory worker will follow the procedure to have removed the container from the laboratory as an unwanted material.

All Laboratories should have an adequate spill kit. All laboratory personnel must be familiar with this equipment and know how to deploy it. In addition all personnel must be familiar with the Campus spill response procedures and emergency management (Refer to UPRMs Emergency Response Plan).

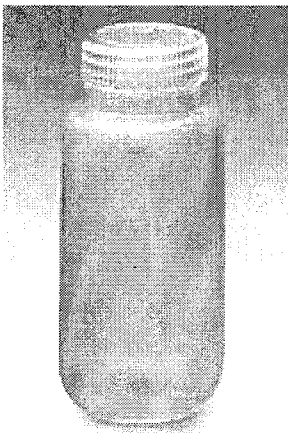
Suggested Containers for Handling of Unwanted Material



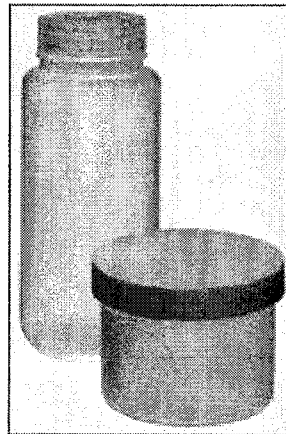
HDPE Narrow-Mouth Bottles



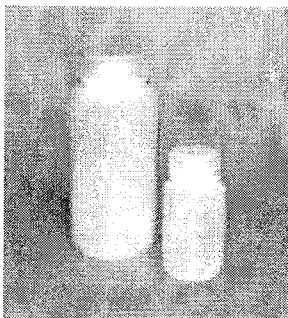
HDPE Wide-Mouth Oblong Bottles



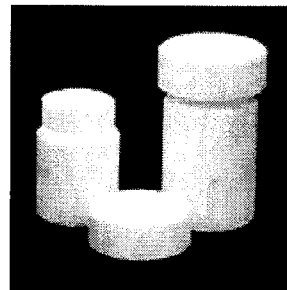
Wide-Mouth LDPE Bottles



Wide-Mouth Polypropylene Bottles
Higher temperature resistance than LDPE or HDPE

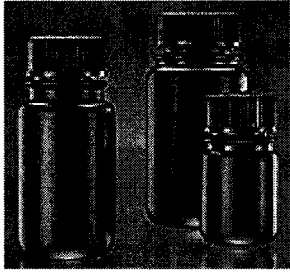


HDPE Round Bottles Rigid, translucent bottles are suitable for storing a variety of items including liquids, solids, and chemicals



Wide-Mouth PTFE Bottles

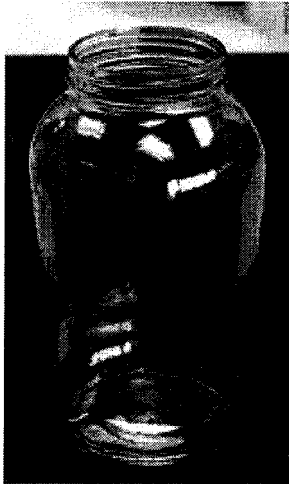
JW



Amber Wide-Mouth HDPE Bottles
Reduces UV light transmission to protect light-sensitive liquids



Amber Narrow-Mouth HDPE Bottles
Protect light-sensitive materials during sampling, shipping or storage



Clear Standard Wide Mouth Bottles with PTFE-faced PE-lined Caps
Good for storing dry materials and specimens



Narrow-Mouth Field Sample Bottles

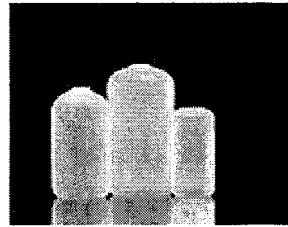


Certified Clean Amber Boston Rounds

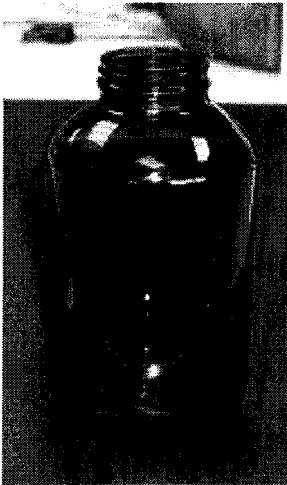
Handwritten signature



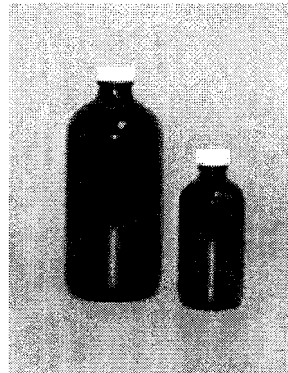
Clear Boston Rounds with PTFE Faced PE-lined Caps



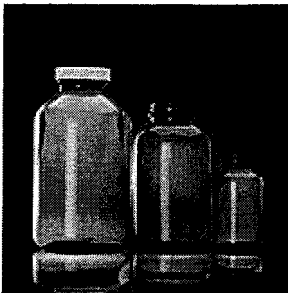
LDPE Boston Rounds



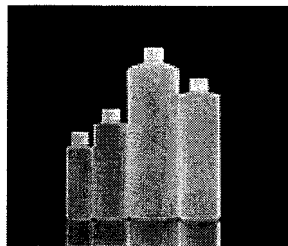
Amber Wide-Mouth Packers with PTFE Faced PE-lined Caps



Safety-Coated Amber Boston Rounds



Amber Wide-Mouth Packers

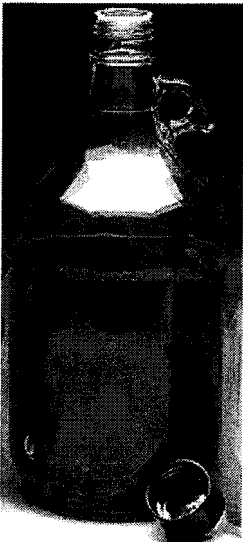


HDPE Cylinder Rounds

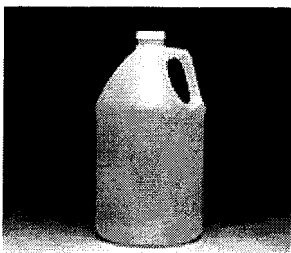
JW



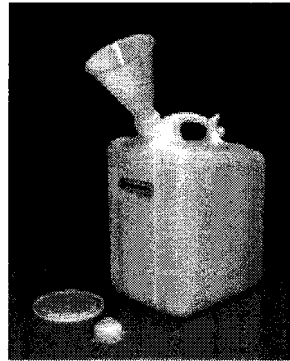
Amber Glass Jugs



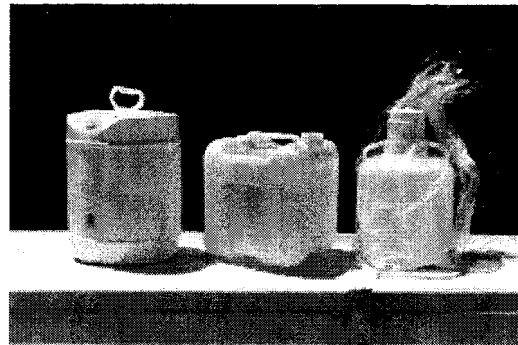
Clear Glass Jugs



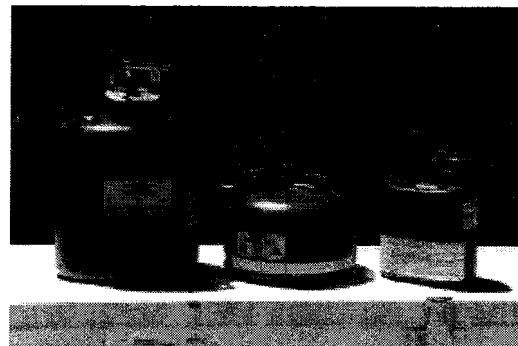
HDPE Jugs



Safety Waste Jug

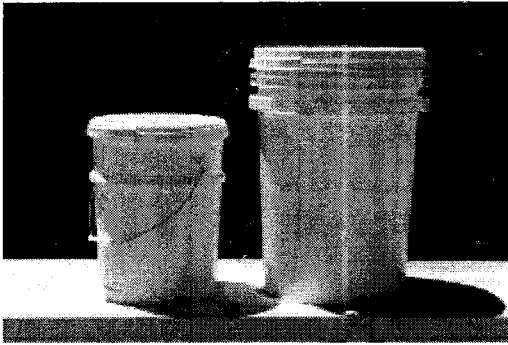


Polyethene Carboy

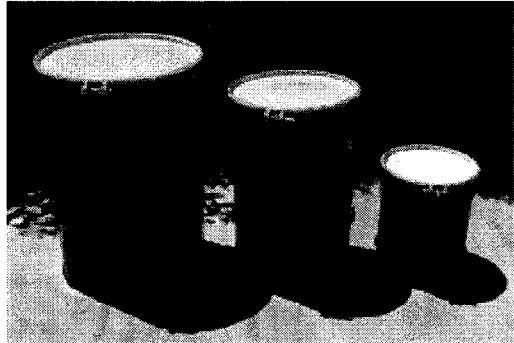


Red Metal or Plastic Safety Can
Used for solvent waste [5 gallon, 2.5 gallons, 1 gallon]

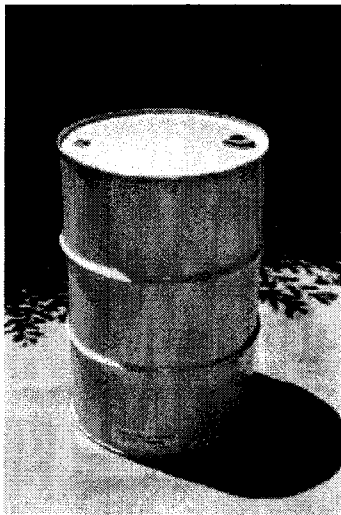
Handwritten signature



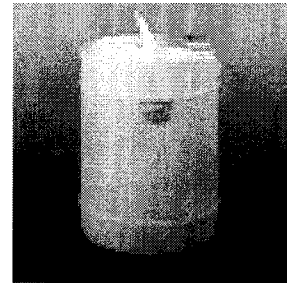
High Density Polyethene Containers
[5 gallons, 12.2 gallons]



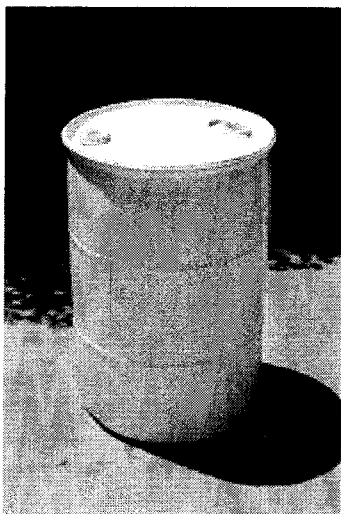
Metal Drums
[55 gallons, 30 gallons, 10 gallons]



Metal 55 gallon, closed head drum
Used for large volumes of non-corrosive liquids



5 Gal Poly drum




Polyethylene Drum
[55 gallon, Closed head]
Used for large volumes of liquid corrosive wastes



5 gallon pail

Management of Unwanted Material Containers



The tips in this section were obtained from the *"Best Management Practices Handbook for Hazardous Waste Containers"* developed for the Environmental Protection Agency (EPA) Region 6, for the Compliance Assurance and Enforcement Division of EPA Region 6 and adapted by UPRM Environmental Management Office to fit the university's academic environment.

Tips for Waste Characterization

1. Look at a material safety data sheet (MSDS) if it is available. Some information areas on the MSDS to look for are physical property, reactivity, fire and explosion hazard, and special protection information.
2. If a product being used in a process meet some or more hazardous characteristics, the waste generated may exhibit some of the same characteristics.
3. Be aware of any changes in a process which could alter the composition of the waste generated.

Tips for Waste Characterization of Containerized Waste

1. Pay attention to marking/labeling which may indicate that a material is flammable, corrosive, etc.
2. Always check with your supervisor before handling unknown containers, or containers which you feel are labeled or marked incorrectly.
3. Look at a material safety data sheet (MSDS) if it is available.
4. If waste is in a plastic container it is a good indication the waste may be corrosive. Special methods and equipment may be required to manage wastes which are:
 - a. Corrosive
 - b. Combustible
 - c. Flammable
 - d. Oxidizer
 - e. Poison
 - f. Toxic
 - g. Reactive

Tip for Container Selection


1. Consult a corrosion resistance guide to determine if the container and waste are compatible.

Tips for Safely Putting Wastes in Containers

1. Make sure you know which wastes are reactive and/or incompatible. Keep these wastes away from each other. Put them in separate containers.
2. Make sure the container cannot be harmed by the waste.
3. If you rinse out containers onsite, be aware that rinse water generated from drum washing must be contained and characterized prior to disposal.

4. If you frequently reuse containers, consider "assigning" wastes to certain containers. This will allow you to reuse the container without washing.
5. Use a funnel to prevent spills, and do not use the same funnel for all wastes.
6. Certain chemicals may need room for expansion, or they may require zero headspace depending on the characteristics of the waste and storage conditions (e.g., temperature fluctuations)

Tips for Marking/Labeling Containers

- 
1. Have all personnel use the same method (e.g., handwritten, prepared labels) to label containers. Make sure all handlers know what the markings mean.
 2. Besides the start date and the words "Hazardous Waste," include information about contents e.g., toxic, reactive, incompatible).
 3. Apply DOT labels to the container when waste is first placed in the container. The label will be in place for shipment and provides information about the waste to drum handlers.
 4. Before reusing containers, make sure all old markings/labels are washed off or blacked out.

Tips for Safely Managing Containers

1. Use a funnel or hose to add or transfer wastes to containers. This will prevent spills. Remember to rinse the funnel and characterize the rinse water (a dedicated funnel would not have to be rinsed).
2. If you notice a leak, or a container is in poor condition, transfer the waste to a new container immediately.
3. Keep containers cool and dry.
4. Make sure all container storage areas are clearly marked -- keep ignitable/reactive wastes in their own area.
5. Don't stack ignitable/ reactive wastes.
6. Don't push, roll, or drag containers. Use the right equipment to move the drums.
7. Make sure the drums are easy to reach -- keep an open aisle space so that people and equipment can move freely.
8. Don't drive equipment (trucks, forklifts) into container storage areas unless you are moving containers.
9. Keep the containers in a "containment area" to hold spills. Containment can be provided by dikes, berms, or walls.

Tips for Conducting Inspections

1. Follow the inspection checklist – make detailed notes if you find something wrong.
2. Be thorough. Check the tops of containers to look for waste residue or corrosion.
3. Walk all the way around containers – check entire storage area.
4. Check containment area for stains.
5. Note anything unusual in containment area -- even if it might not be a problem.
6. If problems are found, get the problem taken care of immediately.
7. Keep a logbook of the facility's inspection checklists.