Status Active PolicyStat ID 12766613

Beaumont

Origination	12/16/2021
Last Approved	1/19/2023
Effective	1/19/2023
Last Revised	1/19/2023
Next Review	1/18/2025

Document Contact	Jennie Green: Mgr, Division Laboratory
Area	Laboratory-Safety
Applicability	All Beaumont Hospitals
Key Words	GEN.73400, GEN.76000

Laboratory Precautions and Control Measures for Handling Chemicals and Chemical Waste

Document Type: Guidelines

I. PURPOSE AND OBJECTIVE:

All chemicals are considered potentially hazardous. The guidelines presented here are to be followed whenever chemicals are handled. Specific procedures appropriate for each type of chemical hazard are included in the department specific training and procedures.

II. GENERAL HANDLING OF CHEMICALS:

A. Read labels on stock bottles, solutions and manufacturers' reagents carefully.

B. Wear gloves, goggles, masks, aprons or lab coats and use hoods as appropriate.

C. Immediately wash hands or other areas of the skin which come in contact with any chemicals.

D. Carry large jugs or bottles of chemicals with two hands or in special carriers, never by just the neck of the bottle.

E. Pour solutions carefully to avoid splashing. Pour down the side of a container or a stirring rod, if solutions are corrosive or caustic.

F. Use a funnel to pour into small necked vessels.

G. Store chemicals safely in cabinets or on shelves so that they cannot easily fall.

H. Clean up and report spills immediately according to the Laboratory Spill Procedure.

I. Do not work alone when working with potentially disabling chemicals.

J. Do not mouth pipette any reagent or specimen.

K. Do not pour from a large jug into a small beaker or flask. Pour into a larger beaker first.

III. PROGRAM FOR REDUCING HAZARDOUS WASTE:

In an effort to reduced the quantity of hazardous waste requiring disposal, the following guidelines are to be considered when selecting equipment, methods, procedures, etc. for use in the Laboratory, as well as when carrying out research investigations.

A. Determine what hazardous waste will be produced by a procedure or piece of equipment, before instituting or selecting it.

B. Determine what special disposal procedures, if any, will be needed for a particular hazardous waste, as well as the cost associated, before deciding on the procedure or piece of equipment. If other aspects of performance are equivalent, select the procedure or piece of equipment which will produce the least amount of hazardous wastes.

C. When ordering a hazardous chemical, order the minimum amount necessary for the application so as to minimize disposal problems later on. Even if it is more expensive to purchase smaller amounts, the ultimate cost may be less if expensive disposal costs can be avoided.

D. Lab personnel follow proper precautions and use appropriate safety equipment when handling hazardous materials, so as to minimize the risk of spills and their associated hazardous waste disposal problems.

E. When preparing solutions of hazardous reagents, prepare the smallest amount needed so that disposal of unused reagent will be minimized.

F. All waste containers are properly segregated and clearly marked regarding contents, hazards, and other pertinent information.

IV. PRECAUTIONS APPROPRIATE TO SPECIFIC HAZARDS:

A. **ABSORBED THROUGH THE SKIN** - whether or not the chemical involved is a known hazard, nitrile or neoprene gloves are recommended whenever handling chemicals with this warning, avoid skin contact; wash immediately.

B. **COMBUSTIBLE LIQUID** – Pour in a fume hood; wear eye protection when pouring; avoid sources of flame, spark or hot surfaces; avoid inhalation or skin contact; store in a cool place.

C. **COMPRESSED GAS** - Portable Medical Gas Cylinders

D. **EXPLOSIVE** - wear eye protection; avoid heat, shock or pressure; store in a cool place.

E. **ORGANIC PEROXIDE** - avoid contact with combustible material or reducing substances; avoid heat or pressure; potentially explosive.

F. **OXIDIZER** - avoid skin contact and inhalation if dusts are likely; avoid contact with reducing substances or combustible materials.

G. **PYROPHORIC** (liable to ignite spontaneously on exposure to air) - refer to manufacturer's insert or material safety data sheet for specific handling instructions; consult with the manufacturer or with a clinical chemist before using; store refrigerated.

H. **UNSTABLE (REACTIVE)** - wear eye protection; avoid heat, shock or pressure; store in a cool place.

I. **WATER REACTIVE** - avoid contact with water except as part of a recommended procedure; use in well ventilated area or a hood if possible.

J. **CARCINOGEN/MUTAGEN** - wear gloves/lab coat when weighing or transferring; if chemical is powdery, wear a dust mask and work in a hood, if available; wash hands after handling

K. **CORROSIVE** - see Acids and Alkalis.

L. **LACHRYMATOR** (substance that irritates the eyes and causes tears to flow) - avoid exposure to vapors, use in a hood.

M. **IRRITANT** - wear eye protection; avoid skin contact or inhalation; work in a fume hood, if volatile or powdery.

N. **RADIOACTIVE** - Refer to the procedure Anatomic Pathology Radiation Safety

O. **SENSITIZER** - avoid ingestion, skin contact or inhalation.

P. **TARGET ORGAN EFFECT** - avoid ingestion, skin contact or inhalation; work in a fume hood.

Q. **TOXIC** - avoid ingestion, skin contact or inhalation; work in a fume hood, if volatile or powdery.

V. ACIDS AND ALKALIS:

Strong acids, alkalis and certain other chemicals such as iodine are corrosive and can produce severe burns or tissue destruction. Even in dilute concentration, these chemicals can be an irritant and therefore following the precautions listed below.

A. Transport

1. When transporting large jugs of concentrated acid or alkali, use a plastic or rubber bucket carrier.
2. Carry and handle small bottles with both hands.
3. Return bottles to a proper storage location.

B. Pouring

1. Safety goggles or a face shield must be worn when pouring concentrated acids or alkalis.
2. Hold bottle away from face.
3. Do not try to pour from a large container into a small necked vessel. Pour acid or alkali into a beaker first.
4. Use a funnel or pour down a stirring rod to pour into a small necked vessel.
5. Hold large jugs with one hand around the neck and one hand under the base of the jug. Hold smaller bottles with both hand around the middle of the bottle.
6. Wipe up drips and spills immediately and wash hands afterward.

C. Diluting

1. When diluting concentrated acids, add acid to water.

D. Reactivity

1. Perchloric acid is a strong oxidant and in concentrated form is not to be mixed with a reducing substance or an organic solvent.
2. Yellowish or brownish colored perchloric acid is potentially explosive and must be disposed of with extreme care. Notify a manager/supervisor or the Chemical Hygiene Officer if the color is not water clear.
3. Concentrated nitric, hydrochloric and sulfuric acids can release noxious fumes under certain circumstances. Pour or use under a fume hood when this possibility exists.
4. Brownish colored nitric acid is not explosive and represents no abnormal hazard.

E. Storage

1. Jugs of concentrated acid are to be stored in cabinets located near the floor.
2. Concentrated acids and alkalis are not to be stored in the same cabinet or in close proximity to one another.

VI. LABELS AND SIGNS:

A. Refer to the Hazard Labeling System section in the Laboratory Chemical Hygiene Plan.

VII. SAFETY EQUIPMENT:

Appropriate safety equipment for the task must be available whenever chemicals with an associated hazard are used. Certain items, such as a fume hood, need not be available in every laboratory, but must be available within the Laboratory Department. If procedures require chemicals which necessitate frequent use of a piece of safety equipment, then it must be available in the area.

A. Gloves

1. Vinyl or Nitrile - recommended for handling specimens and dry chemicals. Vinyl or nitrile recommended for handling aqueous solutions of carcinogens, corrosives, irritants, oxidizers and sensitizers.
2. Chemical resistant neoprene or nitrile - recommended for handling concentrated acids or alkalis, organic solvents and chemicals absorbed through the skin.

B. Goggles or face shields

1. Must be worn whenever pouring concentrated acids or alkalis or organic solvents and when working with unstable or explosive chemicals.
2. Recommended when working with irritants and in situations where there is a risk of being sprayed by chemicals under pressure (reagent lines on analyzers, etc.).

C. Masks

1. Dust (disposable).

2. Recommended when transferring or cleaning up spills of dry chemical carcinogens, sensitizers and irritants if there is a risk of inhalation (e.g., chemical is very powdery).

D. Respirator
    1. Not approved for use unless properly trained.

E. Lab coats, gowns, aprons or jackets
    1. Must be worn over street clothes when handling specimens or working with hazardous chemicals in the laboratory.
    2. Do not wear protective clothing worn in the laboratory while processing specimens or working with hazardous chemicals in areas of the hospital outside of the laboratory.

F. Fume hoods
    1. Must be available in areas where organic solvents or noxious chemicals are being used.
    2. Must be used when pouring flammable or volatile hazardous liquids.
    3. Recommended when transferring dry chemicals with a significant risk of inhalation hazard.

G. Showers and eyewashes
    1. A hand-held shower, sink-basin or faucet-mounted eye wash must be available in any laboratory in which caustic, corrosive, flammable or combustible liquids are used.
    2. Bottle-type eye washes on which the seal has not been broken, are acceptable substitutes for rinsing the eye, but do not substitute for a hand-held spray nozzle when chemicals are spilled on other parts of the body.
    3. Hand-held spray nozzles can substitute for an overhead shower.

H. Fire extinguishers
    1. Must be available in any area in which flammable or combustible chemicals are used.

I. Tongs, hot pads or insulated gloves
    1. Must be available where hot or cold vessels must be handled; such as, deep frozen or autoclaved materials, or liquid nitrogen.

J. Spill cleanup kits
    1. Must be available in the area for the appropriate type of hazard (acid, alkali, flammable solvent, etc.).

K. Absorbent paper
    1. Placed over all bench tops on which radioisotopes will be used.

VIII. CHECK SCHEDULES AND MAINTENANCE:

Certain safety equipment is checked periodically for proper function. It is the responsibility of the manager/ supervisor to verify recommended checks and maintenance are done and documented according to the following schedules.

A. Fume hoods
    1. Properly maintained and inspected annually by the selected vendor. Any hood not passing inspection are taken out of service immediately and not used until the hood has passed inspection.

B. Emergency Eyewash and Shower Equipment
    1. Refer to Laboratory Emergency Eyewash and Shower Equipment

C. Spill clean-up kits (Locations identified with a posted sign)
    1. Checked periodically for adequacy of supply and replaced as necessary.

D. Goggles
    1. Cleaned with disinfectant cleaner after use before being used by another individual.

IX. DISPOSAL OF HAZARDOUS CHEMICALS:

A. Refer to Hazardous Chemical and Waste Management and the product Safety Data Sheet.

B. **NON-MISCIBLE ORGANIC LIQUIDS** (not soluble in water) whether flammable or not, **must not** be poured down the drain. Refer to the Flammable Liquids in the Laboratory procedure for specific details.

C. **WATER REACTIVE CHEMICALS MUST NOT** be poured down the drain. Contact manufacturer for disposal recommendations.

D. **CARCINOGENS, CORROSIVES, OXIDIZERS, IRRITANTS, SENSITIZERS AND TOXIC CHEMICALS** may generally be discarded into the sanitary sewer system in small amounts, if they are water soluble.
    1. Dilute and flush with copious amounts of water after dumping.
    2. If large amounts (for example, multiple jugs of concentrated acids) are involved, dispose of no more than 2 liters per day and spread the disposal over several days.
    3. Wear goggles, gloves and a lab coat or apron if acid or caustic solutions are involved. Pour slowly with water running so as to minimize splashing.

E. **WATER SOLUBLE DRY CHEMICALS** may go down the drain unless they are potentially toxic. In such cases, commercial disposal may be needed. Consult with the Chemical Hygiene Officer, a chemist or the manufacturer.

F. **NON-TOXIC DRY CHEMICALS** may be discarded in the solid trash, if not water soluble.

G. **TOXIC, NON-SOLUBLE DRY CHEMICALS** may require commercial disposal. Consult with the Chemical Hygiene Officer, a chemist or the manufacturer.

H. **SODIUM AZIDE** - Refer to section Additional Chemical or Physical Hazards in the Laboratory in

the Laboratory Chemical Hygiene Plan

I. **MERCURY**-collect in a plastic bottle for commercial disposal through the safety department. Store the bottle in a fume hood if possible. Keep bottle tightly closed. For **BROKEN THERMOMETERS** refer to the Hazardous Material Spill Response Plan.

J. **SPILLS**. Refer to Laboratory Spill Procedure

K. **FLAMMABLE LIQUID CHEMICAL WASTE TRANSPORT AND DISPOSAL TRAINING CHECKLIST**

1. Laboratory employees who transport and dispose of flammable liquid chemical waste in the facility's hazardous chemical waste room or in the flammable liquid chemical waste drums will complete training before performing this job duty. The Laboratory Flammable Liquid Chemical Waste Transport and Disposal Training checklist for Laboratory employees can be found in the attachment section of this policy.
    a. The Laboratory department manager/designee will provide training following laboratory policies and document the training on the attached checklist. The department manager will also provide any facility specific training unique to their campus laboratory.
        i. The department manager will retain the completed employee training checklist.
    b. Laboratory employees will review the Safety Data Sheets (SDS) in the MSDSonline SDS application located on the Beaumont intranet for the chemicals that they are transporting for disposal.
2. The Laboratory department manager will report discovered problems within the hazardous chemical waste room/ waste drums to their campus Facilities Management department and Environmental Services (EVS).
3. Refer to Flammable Liquids in the Laboratory and the attached Risk Assessment Pouring Flammable Liquids.

X. CHEMICAL ACCIDENTS AND OVEREXPOSURES:

A. **Eye Injury - Prevention and Treatment**

1. Stir or shake all solutions, especially solvents and caustic or corrosive solutions resolutely, but not with undue vigor.
2. Vessels are to be well stoppered. Vessels should be pointed away from the eyes when vortexing, and the face is not be near the vessel when stirring by hand.
3. Pour liquids carefully at a reasonable distance away from the face, but not so exaggerated as to invite an accident.
4. Wear safety goggles when pouring acids or alkalies, or working with solvents or on pressurized reagent lines. This is especially important for those who wear contact lenses because substances may seep behind the lens which prevents washing away of the injurious substance.

5. If corrosive or other dangerous substances splatter into the eye, reach an eye-wash station, remove contact lenses if worn, and wash the eye for at least 15 minutes. Because an eye-injured person may be unable to reach an eye-wash without aid, the injured person should call for help in getting to an eye-wash. For that reason, it is best not to work alone when using a potentially disabling procedure.

B. **Chemical Exposure**

1. Accidents involving chemicals may be hazardous because of contact with the skin, eyes, or mucous membranes of the nose or mouth or due to inhalation of fumes. In the event of a spill or splash contact, the almost universal treatment is to IMMEDIATELY FLUSH THE CHEMICAL FROM THE AFFECTED AREA WITH WATER. A sink faucet, handheld shower, overhead shower, sink eyewash or bottle eyewash may be used depending on the location and size of the area affected. The only EXCEPTION WOULD BE A WATER REACTIVE CHEMICAL which could pose a greater hazard if mixed with water. Brush off or wipe off chemical with dry paper towels as much as possible first, then flush with water.
2. The following general guidelines and detailed procedures for specific types of chemicals are recommended in any accident or exposure involving chemicals. In all cases, inform the manager/supervisor and the online injury report filled out. Refer to Work Related Injury and Illness. Refer to MSDS for specific chemical information.
3. The employee is referred to the Emergency Center (if immediate attention is needed) or the Employee Health Service. A report of the physician's evaluation must be made available to the employee, if requested. A record of the evaluation report must be kept for 30 years beyond the date at which the individual involved is no longer an employee.
4. Contact Exposure to Skin
    a. Call for assistance.
    b. Flush copiously with water.
    c. Remove contaminated clothing so water has access to the skin.
    d. If severe burns are involved, apply cold wet cloths, gauze or paper towels to the affected area.
    e. Proceed, with assistance, to either the Emergency Center or the Employee Health Service for evaluation.
5. Contact Exposure to the Eye
    a. Call for assistance.
    b. Flush copiously with water for at least 15 minutes by:
        i. Using a sink eyewash or handheld shower.
        ii. Cupping your hand under a regular faucet and splashing water into the eye.
        iii. IMPORTANT: Be sure to keep the eye open enough to allow water to flood the surface. DO NOT RUB THE EYE.

iv. If contact lenses are being worn, remove the lens.

v. If acid or alkali is involved, DO NOT neutralize with the opposite type of solution since the heat of reaction may injure delicate eye tissue.

vi. Apply cold, wet cloth or gauze to the eye.

vii. Proceed, with assistance, to the Emergency Center for evaluation.

C. **Liquid Nitrogen Burn**: Refer to Safe Use and Handling of Cryogenic Materials

D. **Inhalation Exposure**

1. If during the course of working with any chemical, you begin to experience:
    a. Dizziness or weakness
    b. Nausea
    c. Breathing difficulty
    d. Vision difficulty
    e. Headache
    f. Heart palpitations
    g. Call for assistance.
    h. Leave the area and get some fresh air.
    i. Proceed, with assistance, to the Emergency Center or Employee Health Service for evaluation.

E. Spill Clean Up: Refer to Laboratory Spill Response.

XI. REFERENCES:

A. Hazard Communication Program
B. Laboratory Chemical Hygiene Plan
C. MSDS online
D. Personal Protective Equipment-MIOSHA
E. Monitoring Hazardous Gases and Vapors
F. Safe Chemical Storage
G. Laboratory Annual Safety Assessments
H. Work Related Injury and Illness
I. Laboratory Personal Protective Measures
J. Formaldehyde

Attachments

Flammable Liquid Chemical Transport and Disposal Training Checklist - 11 2022

Risk Assessment Pouring Flammable Liquids 10.28.22

Approval Signatures

Step Description	Approver	Date
CLIA Site Licensed Medical Directors	Jeremy Powers: Chief, Pathology	1/19/2023
CLIA Site Licensed Medical Directors	Vaishali Pansare: Chief, Pathology	1/17/2023
CLIA Site Licensed Medical Directors	Ann Marie Blenc: System Med Dir, Hematopath	1/13/2023
CLIA Site Licensed Medical Directors	Kurt Bernacki: System Med Dir, Surgical Path	1/11/2023
CLIA Site Licensed Medical Directors	John Pui: Chief, Pathology	1/11/2023
CLIA Site Licensed Medical Directors	Ryan Johnson: OUWB Clinical Faculty	1/11/2023
CLIA Site Licensed Medical Directors	Muhammad Arshad: Physician	1/11/2023
Policy and Forms Steering Committee Approval (if needed)	Gail Juleff: Project Mgr Policy	1/11/2023
Policy and Forms Steering Committee Approval (if needed)	Jennie Green: Mgr, Division Laboratory	1/11/2023
Operations Directors	Sarah Britton: VP Laboratory Svcs	1/11/2023
Operations Directors	Brittnie Berger: Dir, Lab Operations C	12/22/2022
Operations Directors	Joan Wehby: Dir, Lab Operations C	12/15/2022
Operations Directors	Amy Knaus: Dir, Lab Operations C	12/5/2022
Operations Directors	Elzbieta Wystepek: Dir, Lab Operations B	12/5/2022

Operations Directors	Kimberly Geck: Dir, Lab Operations B	12/2/2022
Operations Directors	Amy Conners: Dir, Lab Operations A	12/2/2022
Quality Best Practice	Jennie Green: Mgr, Division Laboratory	12/2/2022
	Jennie Green: Mgr, Division Laboratory	12/2/2022

Beaumont HEALTH

Beaumont Laboratory
Dearborn • Farmington Hills • Grosse Pointe • Royal Oak • Taylor • Trenton • Troy • Wayne

LABORATORY FLAMMABLE LIQUID CHEMICAL WASTE TRANSPORT AND DISPOSAL TRAINING

EMPLOYEE NAME:	EMPLOYEE ID:	PERFORMANCE EXPECTATION:
		1. Observed / Discussed
CAMPUS LOCATION/DEPARTMENT / SECTION:	EMPLOYEE JOB TITLE:	2. Performed with Supervision
		3. Approved to Perform without Supervision / Competent

Training Steps			TRAINING SIGN OFF (Trainer & Employee: Initial and date each line per policy)					
			1		2		3	
			Employee	Trainer	Employee	Trainer	Employee	Trainer
A.	**Review Policies and Health Stream Module**	**Notes**						
1.	Laboratory Precautions and Control Measures for Handling Chemicals	Documents > Policies > in PolicySTAT search for Laboratory-Safety > Laboratory Precautions and Control Measures to view policy.						
2.	Laboratory Spill Response	Documents > Policies > in PolicySTAT search for Laboratory-Safety > Laboratory Spill Response to view policy.						
3.	Annual Health Stream module Laboratory Spill and Hazard Communication Training	on-line module						
4.	Flammable Liquids in the Laboratory	Documents > Policies > in PolicySTAT search for Laboratory-Safety > Flammable Liquids in the Laboratory to view policy.						
5.	Laboratory Chemical Hygiene Plan	Documents > Policies > in PolicySTAT search for Laboratory-Safety > Laboratory Chemical Hygiene Plan to view policy.						
6.	Laboratory Personal Protective (PPE) Measures	Documents > Policies > Laboratory-Safety >Laboratory Personal Protective Measures (includes Latex Allergy info) Documents > Policies > Environment of Care-Safety>Personal Protective Equipment - MIOSHA						
7.	Laboratory Department specific policies	Trainer will instruct						
B.	**Steps for Transporting and Disposal of Flammable Liquid Chemical Waste**							
1.	Review the Safety Data Sheets (SDS) in MSDSonline for the chemicals that you are transporting for disposal to understand the required personal protective equipment (PPE), spill clean-up and hazards.	MSDSonline (Beaumont home intranet page, Documents, Safety Data Sheets)						
2.	Collect the flammable liquid chemical waste into approved container(s) for transport to the hazardous chemical waste room.	See Approved Flammable Chemicals tab for a list of flammable liquid. Department trainer will instruct on how to fill the waste containers.						
3.	Laboratory departments may have a chemical waste transport and key sign-out log within their specific area. Document as instructed by Laboratory management. If the campus security department unlocks the chemical waste room, document the request as instructed by Laboratory management.							
4.	Don (put on) the required PPE for transportation, disposal and pouring of flammable liquid chemical waste as instructed by the department management, i.e., goggles or face shield, mask, chemical resistant gloves and Lab coat.	Do not breathe dust/fume/gas/mist/vapors/spray while pouring the flammable chemical waste into the flammable waste drum. Wear gloves and eye protection/face protection and chemical resistant lab coat.						
5.	Place the flammable transport container(s) on a stable transport cart, ensuring the placement is secure and will not allow for containers to fall off cart.							
6.	If a chemical spill occurs in the laboratory department, during your transport or while in the hazardous chemical waste room, follow the instructions in the Laboratory Spill Response policy and inform your department manager. Request help from other employees in the area or call the hospital security, if needed.	Transport cart and hazardous chemical waste room must contain a spill kit for the appropriate chemical being transported/discarded.						
7.	Locate the eye washes and safety showers on the transport and near or in the chemical hazard room. Know the usage of both.							
8.	Upon arrival at the hazardous chemical waste room, ensure the appropriate PPE is donned (put on) for the disposal task.	See Hazardous Waste Drum Locations tab						
9.	Facilities that require chemical waste container drop off only (no pouring into waste drums), document the disposal as instructed by your facility.							
10.	Facilities that require flammable liquid chemical waste pour transfer, proceed with steps 10. a - h.							

			Training Steps		TRAINING SIGN OFF (Trainer & Employee: Initial and date each line per policy)					
					1		2		3	
					Employee	Trainer	Employee	Trainer	Employee	Trainer
		a.	Read the volume gauge on the flammable liquid waste drum: If the gauge level line displays at 3/4 or less, then proceed with remainder of steps. If the flammable waste drums are above 3/4 full, then do not proceed with the pouring of flammable liquid chemical. Return to your department with the flammable chemical waste and inform your manger. The Laboratory manager should contact the campus Environmental Services (EVS) to request a drum exchange.	See flammable drum photos tab						
		b.	If there is enough free volume space in the flammable liquid waste drum for the pour transfer, document the required information on the chemical hazardous waste log and proceed with the liquid transfer process.							
		c.	Employees must inspect the flammable liquid chemical waste drum to ensure the drum is grounded to the grounding bar.	See Bonding_Grounding Tab						
		d.	Bond the flammable liquid waste container (fire safety can) to the metal flammable liquid chemical waste drum when pouring	See Bonding_Grounding Tab						
		e.	Open the funnel lid on the flammable waste drum.	See flammable drum photos tab						
		f.	Slowly pour the approved flammable liquid chemical waste into the flammable liquid chemical waste drum through the funnel opening. Stop the pour process if the liquid level appears to reach the bottom of the funnel and inform your manager that the drum is filled to the funnel. This may indicate a gauge level problem.	See Approved Flammable Chemicals tab for a list of flammable liquid chemical waste allowed for pouring into flammable liquid waste drums						
		g.	Upon completion of the flammable liquid chemical waste transfer, close the funnel lid.							
		h.	Return the department's transport waste containers onto the transport cart and proceed to leave the chemical waste room.							
	11.		Lock the hazardous chemical waste room as instructed by campus Facilities Management/Security.							
	12.		Doff (take off) any PPE that is not required to wear during return to your department.							
	13.		Return the transport containers and cart to the storage location per department.							
	14.		Return, store, and discard the PPE as instructed by your lab management.							
	15.		Problems or concerns discovered within the hazardous chemical waste room should be reported to your Laboratory manager who should then report the issue(s) to the campus EVS (waste drum issues) or Facilities Management (room issues such as burned out light).							
C.	Laboratory Personal Protective (PPE)									
	1.		Laboratory manager/designee trains the employee on proper use, storage and discard of PPE.							
D.	Other training specific to the campus Laboratory site:									

FINAL SIGN OFF and APPROVAL FOR ROUTINE SCHEDULING

EMPLOYEE: *I have completed these training steps, and my questions have been answered adequately. I will follow these safety procedures. I will also inform my department management of any spills or other problems encountered during transport and disposal of flammable liquid chemical waste.*

Employee Name and Signature		Date					

MANAGER/SUPERVISOR (or DESIGNEE): *I have reviewed this employee's training. I have determined the employee to be competent in the areas signed off and therefore recommend that the employee be cleared for flammable liquid chemical transport and disposal.*

Supervisor (or Designee) Name and Signature		Date					
Checklist created August 2022. Located as an attachment in the Laboratory Precautions and Control Measures for Handling Chemicals policy							

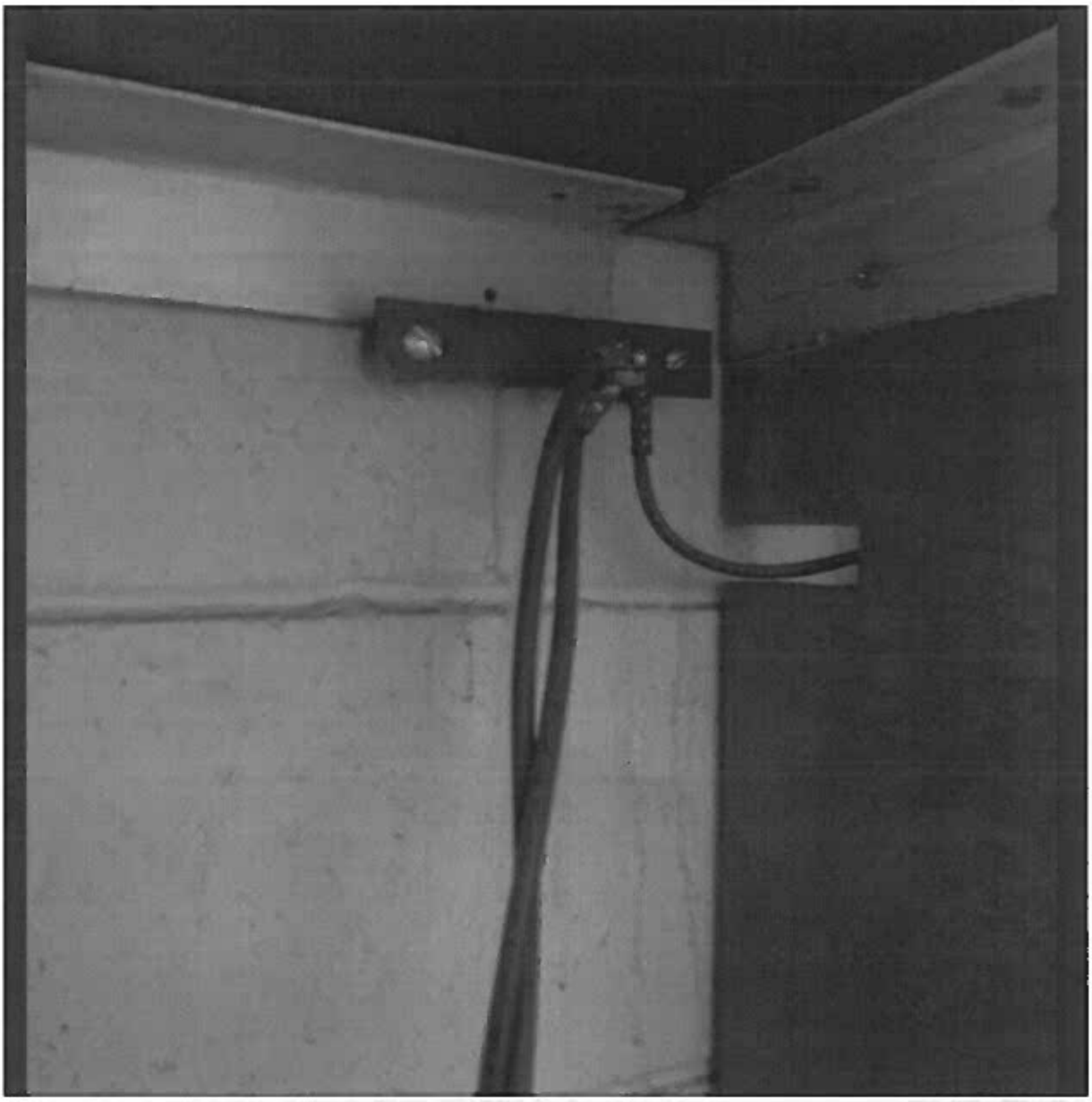
v.11/22/2022

Photo displays the grounding wire clamp, volume gauge and the funnel

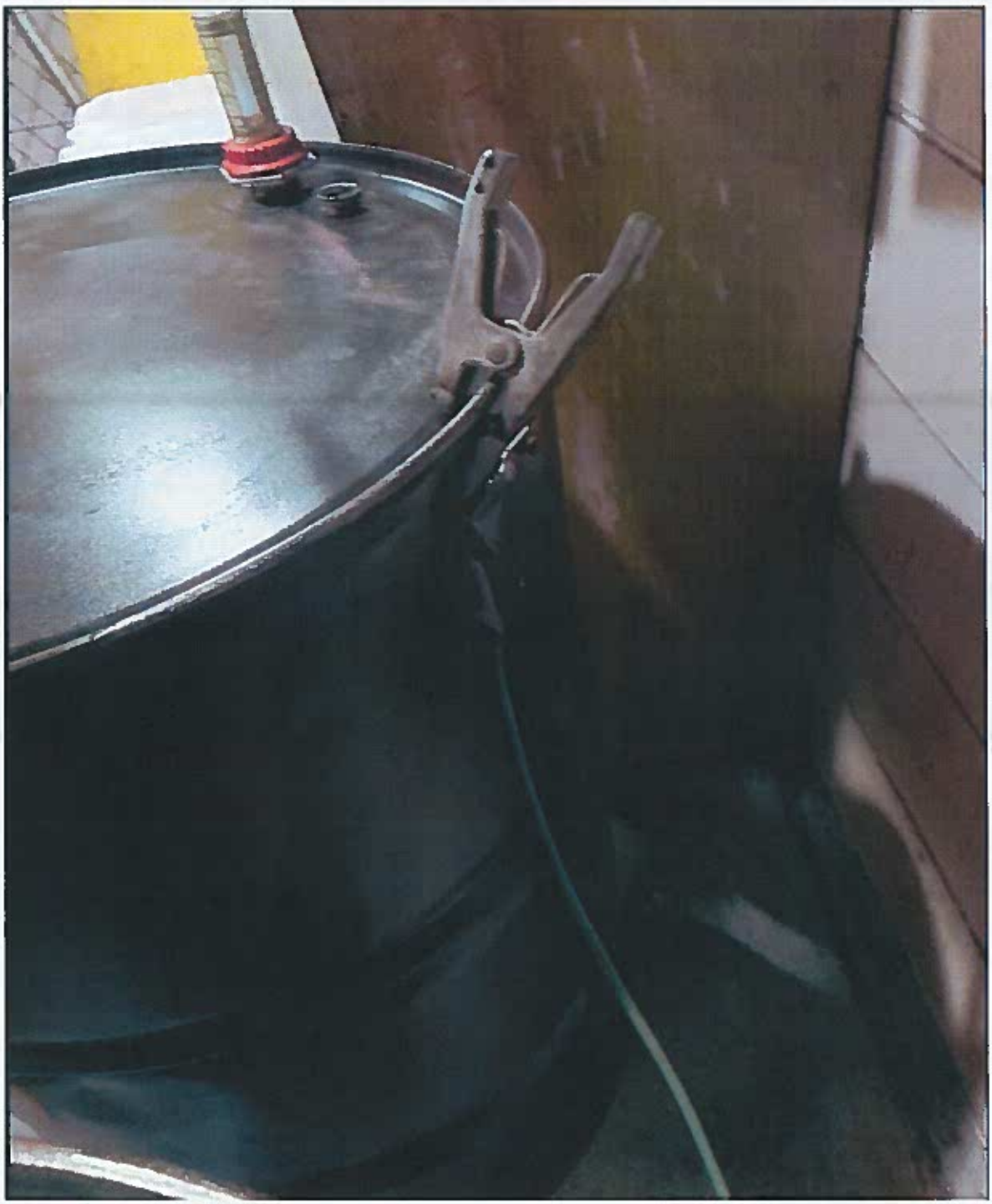

AT-A-GLANCE
F
3
4
1
2
1
4
E
KRUEGER

Examples of Gounding and Bonding

Ground Bar

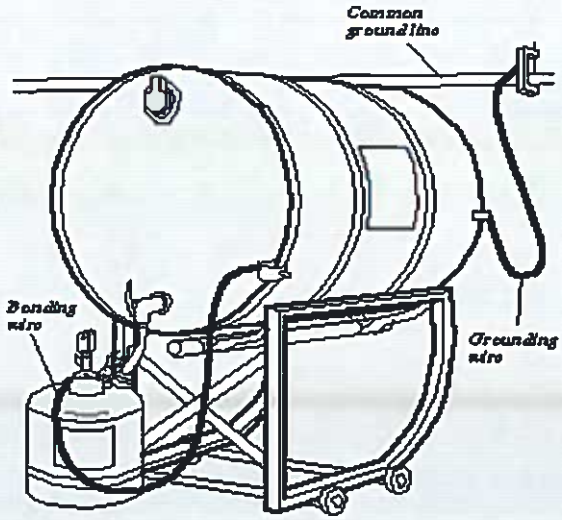


Equipment Ground to Drum



Building equipment grounding conductor

Example of Grounding and Bonding:



Acceptable flammable chemicals allowed for pouring into the flammable liquid chemical waste Drum:			
Xylene			
Xylene Solutions:	ProPar		
Alcohol			
Alcohol Solutions:	Methanol	Ethanol	Isopropyl Alcohol
Acetone			
Safranin			
Micro Stain collection combination of Safranin, Crystal Violet, Iodine, methanol and alcohol/acetone mix.			

Note: Iodine and Crystal Violet in their pure form should not be poured into the flammable chemical drum. Instead, hand off these chemicals to the contracted Environment Hazard vendor.

Hazardous Flammable Chemical Liquid Waste Drum/Drop off Locations

Royal Oak:	South Dock - Lower level in the material handling area
Troy:	North East area Ground Floor Area E
Dearborn:	Shipping and Receiving Dock area
Grosse Pointe:	Shipping and Receiving Dock. Lab does not pour the flammables.
Farmington Hills:	Location 26A0240 - Main Laboratory - Glass Washroom
Taylor	Acid/flammable room across hall from the lab
Trenton:	Shipping and Receiving Dock. Lab does not pour the flammables.
Wayne:	Campus security controlled room. Lab does not pour the flammables.

Mask recommendation can be purchased from the Grainger website: www.grainger.com

N95 Respirators with Exhalation Valve & Nuisance Odor Removal

These general purpose disposable N95 respirators filter nuisance odors and have an exhalation valve. They are used where odors are present or there is high risk of exposure to airborne particles, including woodworking, demolition, and food manufacturing. N95 respirators filter at least 95% of airborne particles. They are not oil-resistant. The exhalation valve opens automatically when the wearer breaths out to allow breath to exit the mask quickly, keeping the wearer cooler and more comfortable. The valve automatically closes when the wearer inhales to ensure all air breathed in is filtered. These respirators reduce or eliminate nuisance odors, such as organic vapors and acid gas, that are found in demolition work and food

Policy reference: Respiratory Protection Program
(EOC Safety)
Section IV D. Respirator Selection, 8.
Particulates with Nuisance level Acid Gas Relief
3M8516

References

https://www.newpig.com/expertadvice/customer-questions-grounding-and-bonding-drums-of-flammable-
https://www.osha.gov/laws-regs/standardinterpretations/2003-11-26

Beaumont

Risk Assessment

Describe the Issue:	Lab employees pour flammable liquid waste in 55-gallon drums in flammable storage rooms (RO, Troy, Dearborn). To prevent fires or employee injury, hazardous liquids require special precautions in storage, handling and use.
Those involved in the discussion:	Amy Blazejewski, Jennie Green, Mike Champine, Matt George, Tim Rowlett, Rich Pointe, Tim Poszywak, Jeff Engel

Arguments in support of the issue—why things should remain the same.	**Arguments against the issue—why things should change.**
Xylene and Xylene solutions, Alcohols and Alcohol solutions, Methanol, Ethanol, and Isopropyl Alcohol - should only be poured in the flammable drum	(OSHA Standard Interpretation - March 29, 1999 - Bonding and grounding of plastic containers during transfer of Class I flammable liquids) The bonding and grounding of two non-conductive containers would seem unnecessary since non-conductive materials are insulators (i.e. plastic) and therefore they cannot conduct a current through them. However, static electrical charge can be generated when two dissimilar materials pass quickly by one another. OSHA recognizes that there are many factors that affect the size and strength of the static charge or potential that may develop (i.e. speed of transfer, humidity, container size, and others). OSHA is concerned that any static charge that develops between two containers be equalized, if not eliminated, so that no potential for a static discharge between the containers exists. Therefore, OSHA will permit the transfer of Class I liquids between plastic or other non-conductive containers under the following conditions: A non-conductive container must be equipped with an approved metallic suction pump and draw tube for taking liquid from the top of a plastic container. The pump must be electrically grounded, or The non-conductive container must be equipped with a metallic, self-closing faucet that can be grounded electrically.
Occupational Safety and Health Administration (OSHA) and the National Fire Protection Association (NFPA) require drums and other containers to be bonded and grounded during fluid transfer – best practice is to apply this to storage in our central accumulation areas/flammable storage rooms as well	As a non-conductive material, plastic is not suitable for bonding or grounding because static electricity cannot flow through it into bonding or grounding wires.
Grounding drums of flammable wastes provides a path for static electricity to be safely dissipated into the earth. Bonding containers prevents sparks between them by equalizing their potential energy	

Drums are fitted with a steel, safety drum funnel with latch specifically designed to safely transfer hazardous liquids into drums with minimal spillage. Fusible links melt and snap cover closed for additional safety in case of fire. Flame-arresting brass tube helps protect contents from exterior ignition sources		
The safety drum funnels, by their nature provide a direct connection (ground) to the metal drum which is connected to the facility's building ground system/grounding rod with a grounding wire.		
Best practice is to transfer the flammable liquid from the metal fire safety cans (or the like) through the funnel to the drum **with all metal components and proper bonding and grounding**		
OSHA 1926.152 S&H Regulations for Construction Subpart F Fire Protection and Prevention, Flammable Liquids (1926.152(e)(2)) Transfer of flammable liquids from one container to another shall be done only when containers are electrically interconnected (bonded). 1926.152(e)(3) Flammable liquids shall be drawn from or transferred into vessels, containers, or tanks within a building or outside only through a closed piping system, from safety cans, by means of a device drawing through the top, or from a container, or portable tanks, by gravity or pump, through an approved self-closing valve.		
Drums are fitted with a gauge to prevent overfilling of flammable liquids and spillage		
Employees must inspect the flammable liquid chemical waste drum to ensure the drum is grounded to the grounding bar		
Bond the flammable liquid waste container (fire safety can) to the metal flammable liquid chemical waste drum when pouring		
Flammable storage rooms are on a monthly PM and visually inspected by Facilities including lighting, ground wires/clamps, combustible storage, room is locked and secure, spills or leaking containers, proper ventilation		
Fire control measures in place including portable fire extinguisher, limited combustible storage, sprinkler system, no open flames/sources of ignition, spill containment and spill response		
Campuses that transfer flammable liquids in smaller volumes within the laboratory itself should ideally be performed in a chemical fume hood and the employee must wear appropriate PPE. Flammable liquid waste must be stored in a		

flammable cabinet for direct pick-up from hazardous waste hauler or brought down to the campus flammable/hazardous storage room for waste pick-up		
Proper ventilation, such as that in the flammable storage areas, chemical fume hoods, etc. will also help minimize hazards. This helps prevent flammable vapors from building up and creating the potential for explosions		
Complete bonding and grounding system verification includes a bonding wire connecting the lid of the drum to the dispensing container and a grounding wire connecting the drum to the facility's building ground system (common ground/grounding rod). See attached pictures and diagram		
Any risk reports or PI data applicable: Spill reported to the HMWM committee, Security Reports or PSQI's N/A		**Any risk reports or PI data Applicable:**
Any sentinel event alerts applicable:		**Any sentinel event alerts applicable:**

Conclusion:	All elements in this risk assessment must be in place and followed for safety during flammable liquid transfer with special focus on: • Hazard Communication training for employees specific to the flammable liquids they will be working with • Drums fitted with a steel, safety drum funnel with latch specifically designed to safely transfer hazardous liquids into drums and by their nature provide a direct connection (ground) to the metal drum which is connected to the facility's building ground system (common ground/grounding rod) with a grounding wire (grounded conductor and clamp). All drums must be grounded and bonded. • Transfer of the flammable liquid should be from a fire safety can or the like through the funnel to the drum with all metal components properly grounded and bonded. Bond the fire safety can to the metal waste drum when pouring using available grounding/bonding wires (provided by Facilities) • Prior to flammable liquid transfer - employees must inspect the flammable liquid chemical waste drum to ensure the drum is grounded to the grounding bar, all drums are bonded, no flammable liquid waste leaks are present, and there is room in the drum per the drum gauge. • All facility related items should be reported through a work order. All spills, leaks, other items should be reported to the EVS Director/Manager • Any employee performing this task must review this risk assessment. Review must be documented.

Timeframe for reassessment, if applicable: As needed	**Date:**	**N/A**
Responsible for follow up, if applicable: Amy Blazejewski	**Person:**	**N/A**
Route form to the Risk Manager: Y / N	**Date:**	

	9.22.22	