UMassAmherst

SAFETY IN THE ARTS

Overview

- Specific roles and responsibilities
- Potential Hazards
- General studio practices
- Training
- Management and Handling of Chemicals
- Right-to-Know about hazards
- Proper PPE
- Safety Equipment
- Incident & Injury reporting
- Hazardous Waste

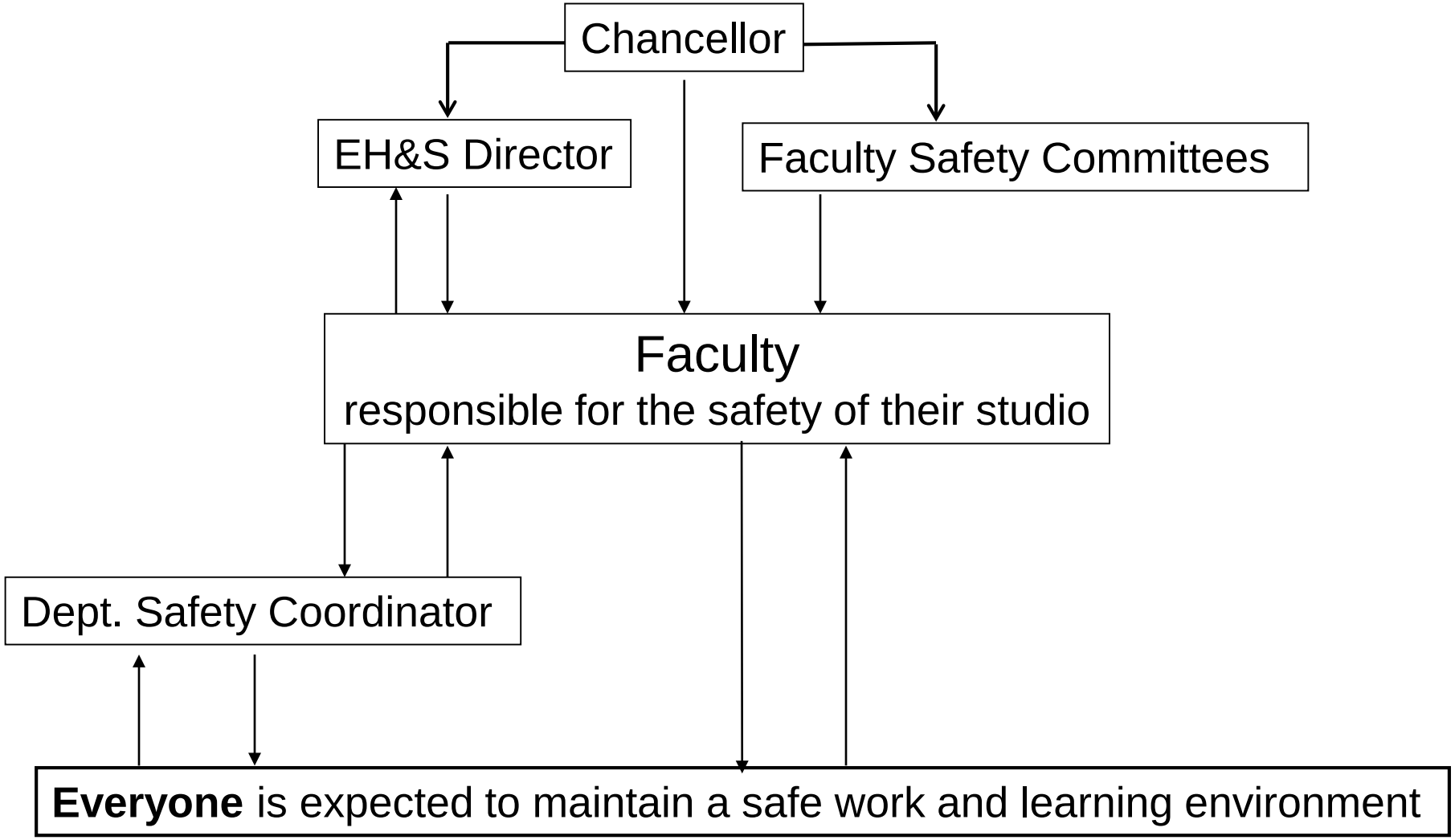
Arts at UMASS

- Painting and Drawing
- Sculpture
- Lithography
- Photography
- Printmaking
- Ceramics
- Textile
- Glass
- Jewelry and Enameling
- Computer Digital Media
- Video
- Animation
- Wood working
- Leather
- Metal working
- Modeling/plastics/wax

Art Safety Training Objectives

- Understand UMass specific policies and processes for work in Art Studios
- Understand fundamental safe work practices and proper personal protective equipment
- Understand where to get further information
- Understand UMass specific procedures for emergency response

Roles & Responsibilities for Safety



General Studio Practices

Door Card

Posted at each studio door. Hazards present and key contact names

LABORATORY SAFETY INFORMATION

Campus Emergency Number (Ambulance/Fire/Police) 911

Environmental Health & Safety	Physical Plant	University Health Services
545-2682	545-0600	577-5000

Location: Studio Arts Building 148	Last Updated On: 2014-12-05
Additional Information:	
Special Instructions:	
Spill Kit Location:	

Emergency Contact	Department	Title	Office Phone	Alternate Phone
Dan Wessman	Art Department	Principal Investigator	545-6969	
Francis Merrigan	Art Department	Dept. Safety Coordinator	413-545-6954	347-526-2757

General Lab Rules

No Food or Drink in the Studios

- No water bottles
- No food related containers in lab trash
- No cosmetics
- No hand creams
- No chewing gum
- No handling contact lenses

Art Safety

Questions you should ask…

- What are the health hazards associated with the materials used in your work area?
- What are signs and symptoms of exposure?
- What measures (work practices, emergency procedures, Personal Protective Equipment, etc.) can be taken to protect yourself from the hazards associated with the materials you use?

EFFECTS OF EXPOSURE

- ACUTE - direct threat that shows up almost immediately after exposure such as burns from contact with a corrosive chemical

- CHRONIC - usually result from repeated exposure that occurs over months or years and includes cancer and some allergic reactions

HAZARD IDENTIFICATION

Safety Data Sheet

Material Safety Data Sheet

Creation Date 29-Dec-2009 **Revision Date** 29-Dec-2009 **Revision Number** 1

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name Deionized Water

Cat No. 290-065, 23-290-065, 751-610, 23-751-610, 751-628, 23-751-628, 25065A

Synonyms No information available.

Recommended Use In vitro diagnostic

Company
Fisher Diagnostics
A Division of Fisher Scientific Company, LLC
A Part of Thermo Fisher Scientific, Inc.
8365 Valley Pike
Middletown, VA 22645-1905
Tel: (800) 528-0494

Emergency Telephone Number
Chemtrec US: (800) 424-9300
Chemtrec EU: (202) 483-7616

2. HAZARDS IDENTIFICATION

Emergency Overview
The product contains no substances which at their given concentration are considered to be hazardous to health

Appearance Colorless **Physical State** Liquid **Odor** odorless

Target Organs None known.

Potential Health Effects

Acute Effects
Principle Routes of Exposure

Eyes No hazard from product as supplied.
Skin No hazard from product as supplied.
Inhalation Low hazard for usual industrial or commercial handling.
Ingestion Low hazard for usual industrial or commercial handling.

Chronic Effects None known.

See Section 11 for additional Toxicological information.

Aggravated Medical Conditions No information available.

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Thermo Fisher Scientific - Deionized Water **Revision Date** 29-Dec-2009

3. COMPOSITION/INFORMATION ON INGREDIENTS

Haz/Non-haz

Component	CAS-No	Weight %
Water	7732-18-5	100.0

4. FIRST AID MEASURES

Eye Contact Flush eyes with water as a precaution. Get medical attention immediately if symptoms occur.

Skin Contact Rinse with water. Get medical attention immediately if symptoms occur.

Inhalation Move to fresh air. Get medical attention immediately if symptoms occur.

Ingestion Do not induce vomiting. Get medical attention immediately if symptoms occur.

Notes to Physician Treat symptomatically.

Massachusetts Right to Know Law

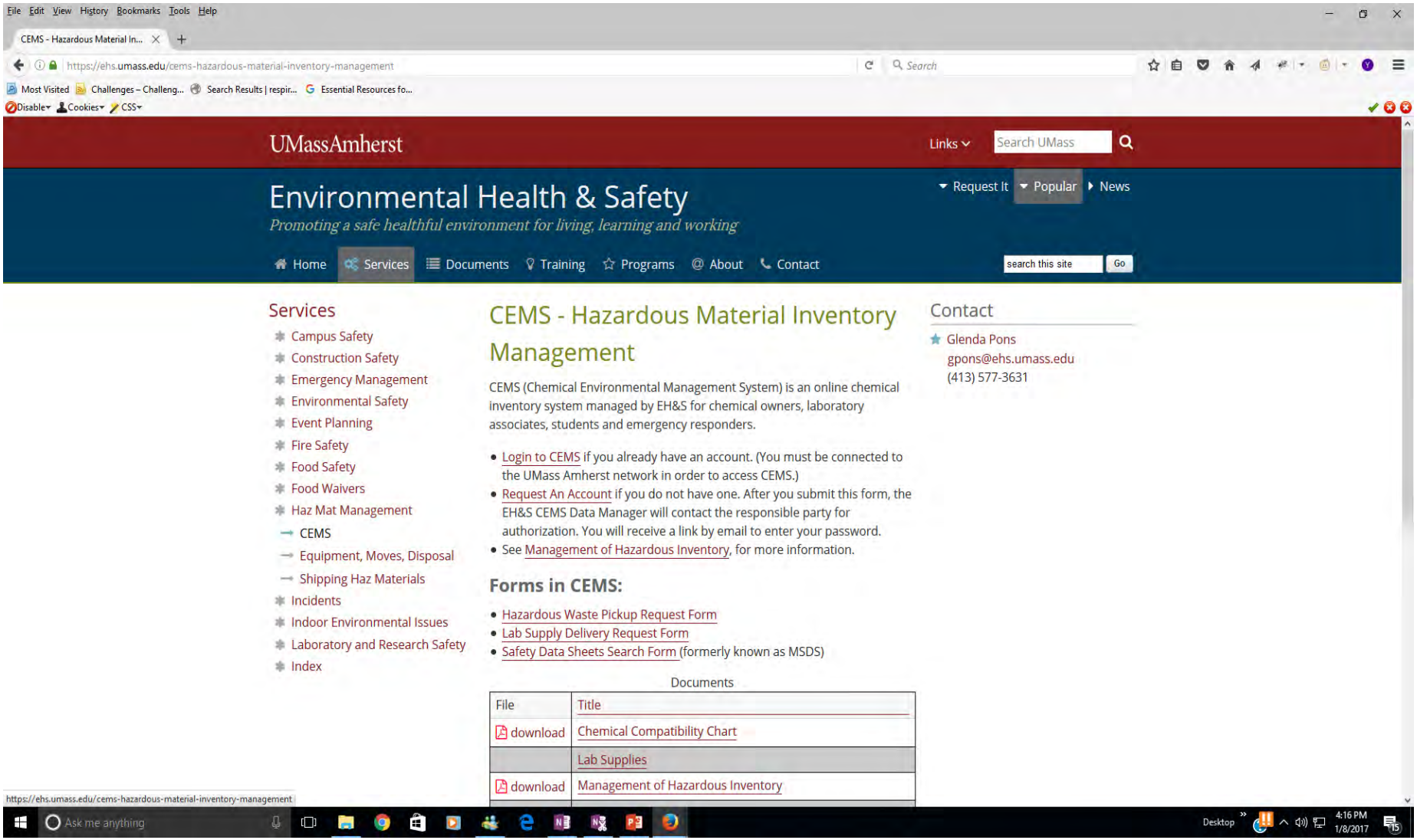
- A law for public employees in Massachusetts
  - Includes students & employees at public colleges
- Based upon the Federal Occupational Safety and Health Administration (OSHA) Hazard Communication Standard
- Requires information such as Safety Data Sheets (SDS) on hazardous substances be distributed to employees and students working in labs in a manner that can be understood
- Also requires labeling and training on hazards

Where to Obtain the SDS

- SDS's for all chemicals are stored in Chemical Environmental Management System (CEMS) which can be accessed by a quick link on the EH&S website
- Delivered with chemicals
- Directly from company supplying chemical

UMassAmherst

EH&S Website Quick Links



SDS Sections

1. Identification
2. Hazard(s) identification
3. Composition/information on ingredients
4. First-aid measures
5. Fire-fighting measures
6. Accidental release measures
7. Handling and Storage
8. Exposure controls/personal protection
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological information
12. Ecological information
13. Disposal considerations
14. Transport information
15. Regulatory information
16. Other information

See Handout for example SDS

GHS – Global Harmonized System

- GHS is an international system for standardizing and harmonizing the classification and labeling of chemicals as well as the format and content of safety data sheets.
- All chemical labels now contain a signal word, hazard statement, and pictogram.

GHS – Global Harmonized System

Health Hazard	Flame	Exclamation Mark
		
• Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity	• Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides	• Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non Mandatory)
Gas Cylinder	**Corrosion**	**Exploding Bomb**
		
• Gases under Pressure	• Skin Corrosion/ burns • Eye Damage • Corrosive to Metals	• Explosives • Self-Reactives • Organic Peroxides
Flame over Circle	**Environment *(Non Mandatory)**	**Skull and Crossbones**
		
• Oxidizers	• Aquatic Toxicity	• Acute Toxicity (fatal or toxic)

GHS LABEL

The Basic Parts of A GHS-Compliant Label

1. **Product Identifier** - Should match the product identifier on the Safety Data Sheet.
2. **Signal Word** - Either use "Danger" (severe) or "Warning" (less severe)
3. **Hazard Statements** - A phrase assigned to a hazard class that describes the nature of the product's hazards
4. **Precautionary Statements** - Describes recommended measures to minimize or prevent adverse effects resulting from exposure.
5. **Supplier Identification** - The name, address and telephone number of the manufacturer or supplier.
6. **Pictograms** - Graphical symbols intended to convey specific hazard information visually.

Sample label courtesy of Weber Packaging Solutions • www.weberpackaging.com

Labeling Hazardous Substances

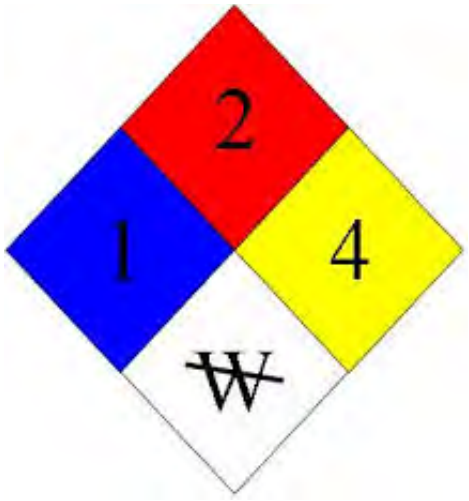
The chemical name or product name *must* appear on all containers of chemicals and mixtures of chemical solutions

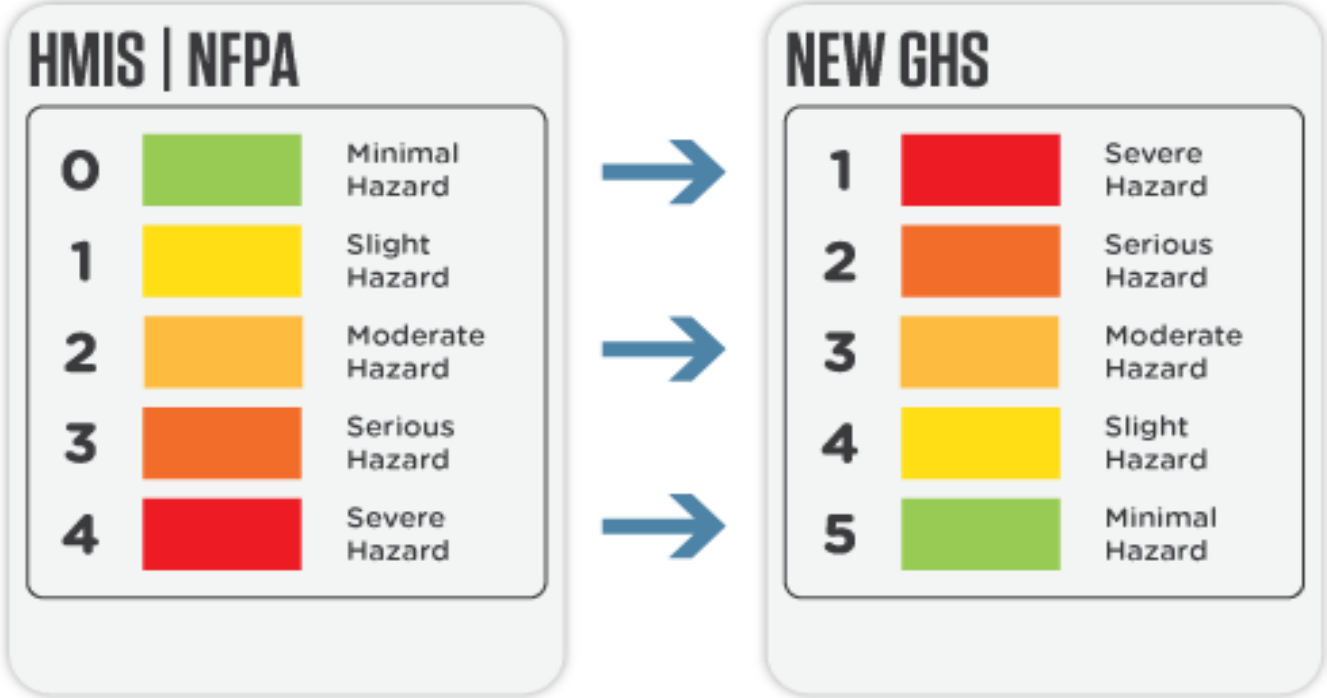
The label should include:

- Chemical constituents
- Hazards
- Date
- Owner

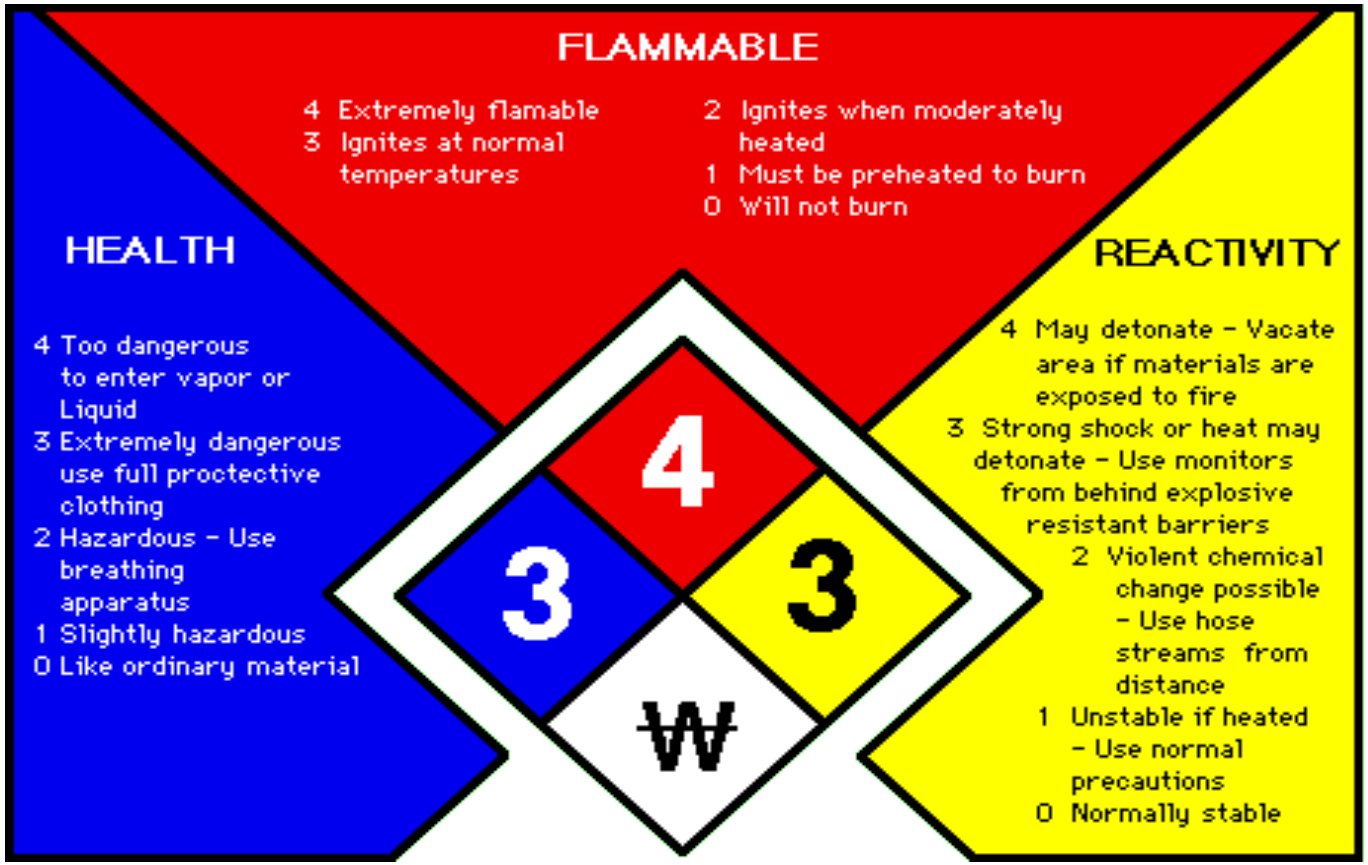
NFPA vs New GHS ratings

- Health, physical and environmental hazards of chemicals categorized using a numerical scale





NFPA LABEL


FLAMMABLE
4 Extremely flamable
3 Ignites at normal temperatures
2 Ignites when moderately heated
1 Must be preheated to burn
0 Will not burn
HEALTH
4 Too dangerous to enter vapor or Liquid
3 Extremely dangerous use full proctective clothing
2 Hazardous - Use breathing apparatus
1 Slightly hazardous
0 Like ordinary material
REACTIVITY
4 May detonate - Vacate area if materials are exposed to fire
3 Strong shock or heat may detonate - Use monitors from behind explosive resistant barriers
2 Violent chemical change possible - Use hose streams from distance
1 Unstable if heated - Use normal precautions
0 Normally stable
4
3
3
W

Potential Hazards

- Chemical – paints, dyes, glazes, inks, solvents, clay, metals, fumes
- Physical - heat, lifting, machinery, tools, noise
- Ergonomic – work stations, tools
- Radiation – lasers, welding, kilns
- Electrical – machinery, tools

Art Safety Video

Routes of Exposure

- Inhalation
- Absorption
- Ingestion

PPE- Gloves

- Gloves should be worn whenever the possibility of skin contact with hazardous materials exist or cut hazards are present.
- Hazardous materials – review Safety Data Sheets (SDS)
- Determine physical resistance properties required of glove: Chemical, heat, cut, puncture resistance.
- Inspect gloves for pinholes, cuts, tears, etc.

PPE- Respiratory Protection

- Respirators may be required if general ventilation or a fume hood are not feasible or provide adequate removal of vapors/fumes

- Before wearing you must be “medically qualified,” fit-tested, and appropriately trained.

- Contact EH&S prior to use of any respirator.

PPE- Eyewear

- Eye and face protection helps protect against impact, dust particles and chemical splashes.
- Chemical goggles should be worn if potential of chemical splash exists (may be worn over prescription glasses) .

PPE- Hearing Protection

Hearing protection must be worn when operating machinery.

PPE- Other

- Unrestrained hair can be a hazard depending on the task being done and equipment used.

- Open toe shoes should not be worn when using chemicals or doing mechanical or cutting work.

Painting Hazards

- Pigments
- Thinners
- Linseed Oil
- Adhesives
- Oil-based paints
- Turpentine

Painting Hazards

- These materials evaporate quickly, contaminating the air, and are moderately toxic by inhalation.
- Solvents can be adsorbed through the skin.
- Many are flammable.

Precautions for Painters

- Know what is in your pigments.
- Use the least toxic material.
- Avoid mixing dry pigments.
- Avoid hand to mouth contact.
- Don’t use your mouth to point your brush.

Paint Pigments

Antimony	True Naples Yellow	Resp and GI Irritation
Arsenic	Cobalt violet Emerald Green	Skin/eye/GI irritation CNS disorders, Cancer
Cadmium	All cadmium pigments	Lung, kidney, CNS disease High BP, anemia
Chromium	Chromium green, strontium yellow, viridian, chrome yellow, zinc yellow	Skin, respiratory irritation Allergies Lung cancer
Lead	Flake white, mixed white, Naples or chrome yellow	CNS disorder, GI problems
Manganese	Burnt amber, Mn blue, Mn violet, Mars brown	Respiratory irritation CNS problems
Mercury	Vermillion	CNS disease

Photography Hazards

- Developers
- Fixers
- Reducers
- Stabilizers

Photography Hazards

- Wide variety of chemicals used in black and white photographic processing
- Print processing uses tray processing with successive developing baths, fixing baths and rinse steps
- Other treatments include use of hardeners, intensifiers, reducers, toners and hypo-eliminators

Photography Hazards

- Glacial acetic acid used in making stop bath is corrosive by skin contact, inhalation, ingestion

- Developer powders are highly toxic by inhalation, and moderately toxic by skin contact (due to alkali and developers themselves)

Photography Hazards

- Developers are skin and eye irritants; in many cases strong sensitizers
- Most developers are moderately to highly toxic by ingestion
- Sodium hydroxide, sodium carbonate and other alkalis used as accelerators are highly corrosive by skin contact or ingestion

Precautions for Photographers

- In case of eye contact rinse for 15 minutes and seek medical attention as soon as possible
- Store concentrated acids and other corrosive chemicals on low shelves
- Do not put bare hands in developer baths, use tongs instead
- Do not use para-phenylene diamine or any derivatives if possible

Precautions for Photographers

- All darkrooms require good ventilation to control level of acetic acid vapors and sulfur dioxide gas produced
- Cover all baths when not in use to prevent evaporation or release of toxic vapors/gases
- Wear gloves and goggles

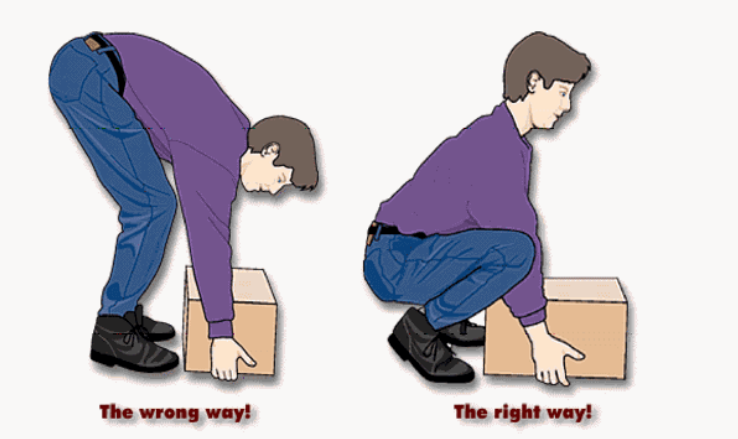
Precautions for Photographers

- Do not pour any chemicals down the drain.
- Photographic solutions are treated as hazardous waste when they are old or no longer used.
- Fixing baths should never be treated with acid (e.g. mixing with stop bath) since they usually contain sulfites and bisulfites which produces sulfur dioxide
- Fixing baths contain large concentrations of silver thiocyanate – should be collected and poured into silver recovery unit or disposed of as hazardous waste

Ceramics Hazards

- Bags of clay and glaze materials are heavy, incorrect lifting can cause back problems
- To prevent back problems always lift with knees bent; avoid bending at waist

Wrong Proper



Ceramics Hazards

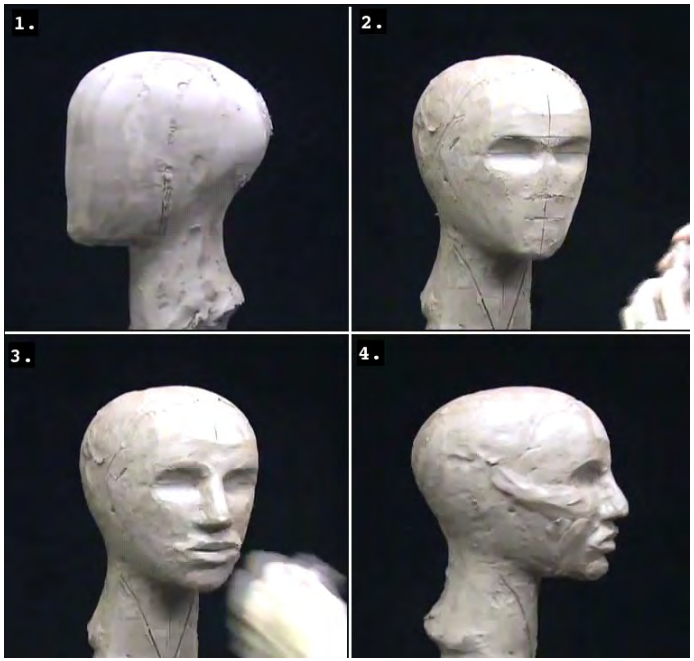
- Hand contact with wet clay can result in abrasion and dryness of fingertips and hands
- Clay scraps on floor, bench, other surfaces can dry and pulverize producing an inhalation hazard of free silica
- Reconditioning clay by pulverization and sanding finished green ware can create very high concentrations of hazardous silica dust

Precautions for Ceramics

- Keep wrists in non-flexed position as much as possible
- Take frequent work breaks
- Use pre-mixed clay
- Use good ventilation
- Clean daily
- Wear IR goggles when looking into kiln

Sculpture

- Plasters, silica, etc.
- Spray Paint
- Clay
- Paints
- Mold-making Resins



Precautions for Sculptors

- Use eye and face protection
- Choose the least hazardous woods and stones
- Do not use plaster for casting body parts
- Use good lifting techniques
- Protect hands against vibration of hand tools
- Use machining tools under supervision

Lithography/Printmaking

- Linseed Oil
- Solvents
- Sharp Tools
- Hot Plates
- Inks
- Nitric acid

Carpentry and Machine Shop Safety

- Never work in a shop alone
- Must be trained an authorized to use equipment
- Training is conducted by the Shop Supervisor
- Training must include
  - Hands on demonstration
  - Review of standard operating procedures/shop rules
- Always follow the direction of the shop supervisor

Types of Guards

- Fixed
  - Metal Plates & Cages
  - Distancing Barriers
- Adjustable
  - Band Saws
- Self-adjusting
  - Table Saw
- Interlocked
  - C&C Machines
  - Laser Cutters

Never remove a machine guard unless for maintenance and the machine is locked out.

Engineering Controls

You must register to use the spray booth in room 115 SAB

- Apply paint behind premarked line.
- Aerosol paint cans only

Engineering Controls

Doors should be closed for efficient exhaust

Save energy, close the sash when not in use

Engineering Controls

Elephant trunk or
Snorkel fume hood

Slot hood

Emergency Response Equipment

- Fire Alarm
- Drench Shower
- Eye Wash Station
- Fire Extinguisher
- First Aid Kit

Know where this area is and how equipment works before you need it

Keep this area free from obstructions so you can reach emergency equipment

Proper Use of Drench Shower

- Call others for help as you move to the drench shower
- Stand under drench shower
- Pull chain or bar to activate the drench shower and let go
- Begin to remove clothing
- Flush affected area for 15 minutes
- Have helper call EH&S or 911
- EH&S will bring something to cover you
- Be careful as water on the floor is a SLIP HAZARD
- Don't worry about cleaning up water, EH&S will have it cleaned up

Delivers 30 GPM at 30 PSI With 20" Spray Pattern at 60" Above Floor

Proper Use of Eye Wash

- Activate the eye wash
- Hold eyes open and place in water stream and move eyes in all directions
- Flush eyes for 15 minutes

Eye wash should be activated and flushed for 3 minutes weekly so that it is ready for use. Mark the date of the flushing on the log sheet

Fire

- Alert all persons nearby
- If your clothing is on fire – STOP, DROP, & ROLL
- Evacuate the area and close the door
- Pull the fire alarm – it will immediately bring help
- If you can safely use a fire extinguisher – do so
- Evacuate the building
- Call 911 or dial 413-545-3111 for UMass Police
  - Give name of building and UMass Amherst
  - DO NOT hang up until told to do so by the operator
- Go to a designated meeting place a safe distance from the building
  - Try to account for all lab members
  - DO NOT LEAVE CAMPUS

Exposure and Possible Injury

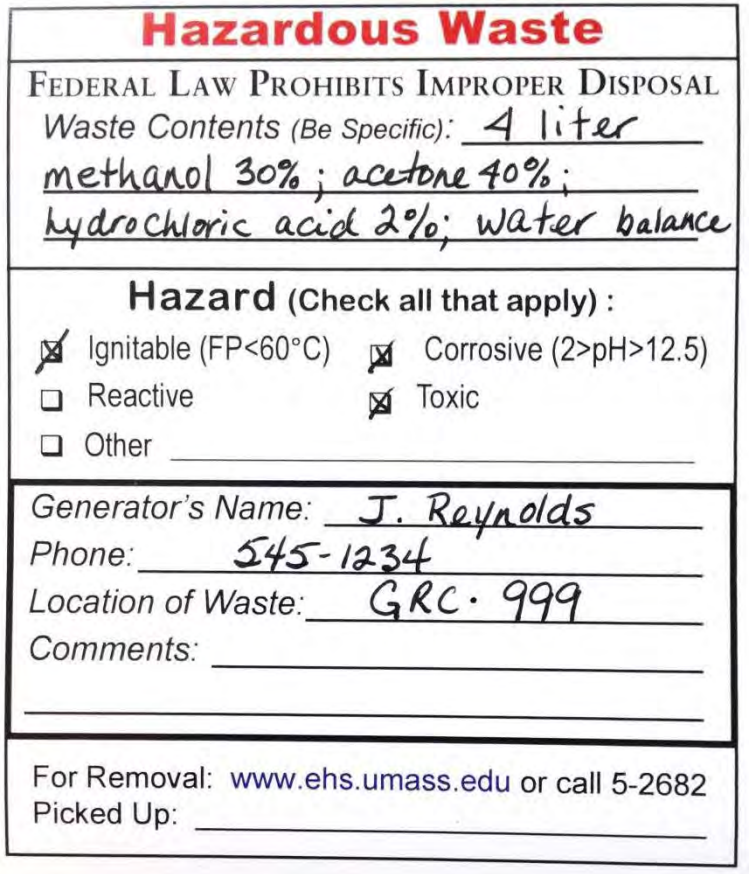
- Always seek medical treatment for post-exposure evaluation and/or treatment within 2 hours of incident
- **Don't hesitate, just go**
  - Go to University Health Services (UHS)
    - Tell the UHS front desk that you had a lab exposure.
      - UHS will not make you wait in line for a lab exposure.
  - Get transported to an Emergency Room by ambulance
    - Do not drive to the hospital yourself; **CALL 911**
      - The cost of ambulance transport to the hospital is covered by your health insurance – a deductible may apply
      - A ride back to campus can be arranged by UHS

Notify EH&S & Supervisor of All Lab Incidents

- Report any event that results in a spill or release of a hazardous material
- Report any event that results in any injury
- Inform lab supervisor and/or faculty PI of all events
- Call EH&S to report incidents/accidents **immediately**
- Complete and submit the Lab Incident Report form to EH&S within 24 hrs: http://www.ehs.umass.edu/lab-incidents-and-lab-incident-report-form
- If injured, complete and submit the Notice of Injury (NOI) form to Human Resources (HR) within 48 hours of the incident: http://www.umass.edu/humres/notice-injury-form

Labeling Waste

- Chemical names must be spelled out. Chemical formulas are NOT acceptable.
- Check chemical compatibility before adding waste to a container.
  - EHS has experienced exothermic reactions due to either a lack of, or an improper description of contents
- EH&S must have accurate information on materials in containers in order to make reasonable decisions on methods of disposal.



Hazardous Waste

FEDERAL LAW PROHIBITS IMPROPER DISPOSAL

Waste Contents (Be Specific): 4 liter methanol 30%; acetone 40%; hydrochloric acid 2%; water balance

Hazard (Check all that apply):

- ☒ Ignitable (FP<60°C)
- ☒ Corrosive (2>pH>12.5)
- ☐ Reactive
- ☒ Toxic
- ☐ Other

Generator's Name: J. Reynolds

Phone: 545-1234

Location of Waste: GRC · 999

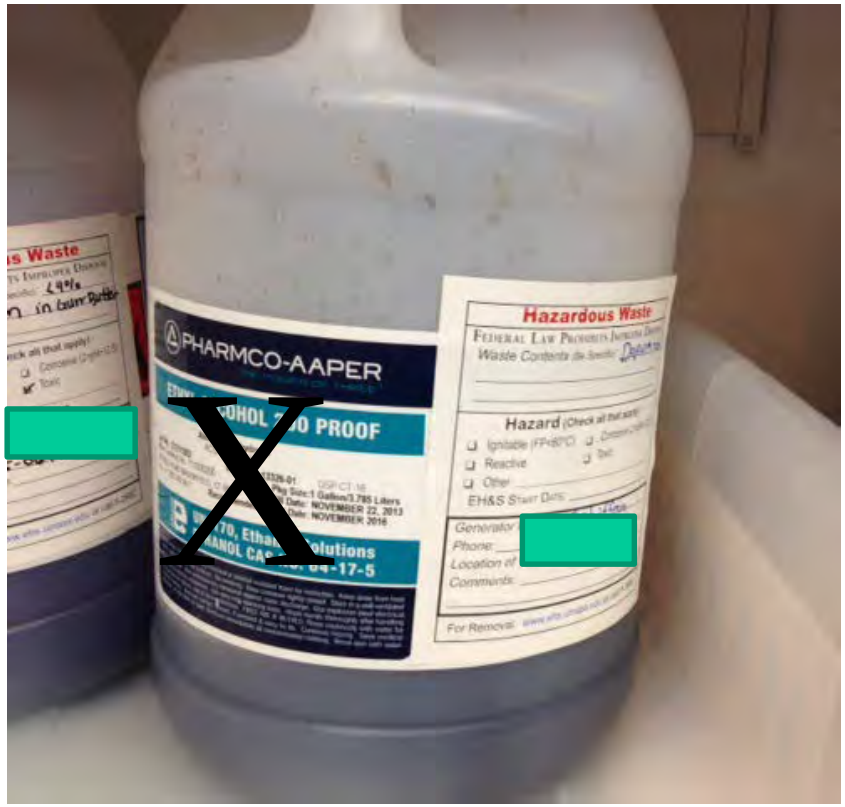
Comments:

For Removal: www.ehs.umass.edu or call 5-2682

Picked Up:

Labeling Waste Containers

- If reusing original containers for hazardous waste, the original label must be removed or defaced.
  - Remove the barcode label as well and adhere it to disposal sheet record.
- If discarding material in the original container do not deface the label.



Solid Waste: Empty Bottles Only

- NO LIQUIDS!
- Laboratory glassware and empty bottles should go into Glass Only box.
  - Box should have plastic liner.
  - Do not overfill.
- Deface labels on chemical bottles.
- Glass Only boxes are available from EH&S.
- Request online in CEMS.
  - http://www.ehs.umass.edu/lab-supplies

Keep flaps down so it is not overfilled

For disposal, request a pick-up on the EH&S website:
http://www.umass.cems.sr.unh.edu/CEMS/RequestRemoval

Hazardous Waste

Household chemicals are classified as industrial chemicals in the laboratory**.**

If it is in a lab,
Do Not Dump It Down The Sink

Contact EH&S with questions regarding proper disposal of chemicals

HAZARDOUS WASTE STORAGE & DISPOSAL

Examples of Waste

- Solvents,
- Oils
- Soiled rags
- Acids and Bases
- Empty chemical containers
- Glazes

HAZARDOUS WASTE STORAGE & DISPOSAL

Hazardous Waste Management Objectives

- Managing Satellite Accumulation Areas (SAA)
  - Waste compatibility
- Disposing of Hazardous Waste
- Regulatory Compliance
  - Performing weekly inspections
  - Labeling
  - Timely removal from the labs

Managing Satellite Accumulation Areas

Weekly Checklist

Weekly Satellite Accumulation Area Inspection for _____ Room #_____ USE ERASABLE MARKER				
KEEP A ROLLING 4-WEEK RECORD. — ERASE ENTRIES FROM OLDEST WEEK COLUMN TO RECORD CURRENT INSPECTION.				
Weekly inspections are required by MA state regulation	**Week 1**	**Week 2**	**Week 3**	**Week 4**
A satellite accumulation area must be located in the same room/floor where waste is generated. Waste should be stored in proper storage cabinets or in a designated area within the lab. Labs may use tape, placards or signs to demarcate a designated satellite accumulation area.	Date ___/___/_____	Date ___/___/_____	Date ___/___/_____	Date ___/___/_____
1.) Are all containers marked "hazardous waste"?	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO
2.) Have you indicated the corresponding hazard(s) for each container?(Ignitable? Corrosive?,Reactive? Toxic?)	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO
3.) Are all hazardous waste containers labeled with chemical names for the corresponding contents? Chemical names must be spelled out. Chemical formulas ARE NOT acceptable	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO
4.) If reusing original containers, have the original labels been removed or defaced?	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO
5.) Is the waste compatible with the container?				
6.) Are all hazardous waste containers in good condition? (e.g no dents, cracks, or loose/broken caps)	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO
7.) Are containers closed except when adding or removing waste?	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO
8.) Is there adequate head space in all containers?	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO
9.) Has a hazardous waste pick up request been submitted for full containers? SUBMITTING A HAZARDOUS WASTE PICKUP REQUEST Go to www.ehs.umass.edu or the CEMS website to fill out a waste request	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO
10.) Do all containers have adequate secondary containment for spill prevention?	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO
11.) Spilled material in the secondary containment vessel has been cleaned?	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO
Date Corrective Action Completed				
Briefly describe any corrective actions				

Use dry-erase marker to write on this plastic coated form. When full, erase oldest entry and start over.

Location of Satellite Accumulation Areas (SAA)

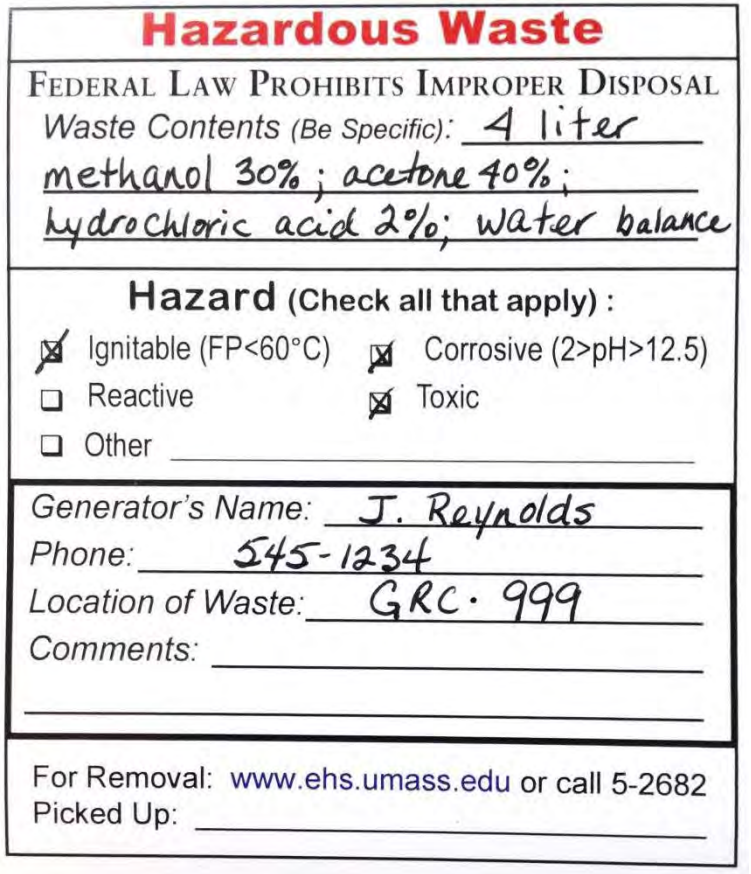
- Must be located in the same room/floor where waste is generated
- Store in proper storage cabinets or in a designated area within the lab
- Use tape, placards or signs to demarcate a designated satellite accumulation area

HAZARDOUS WASTE STORAGE & DISPOSAL

- Oily rags must be placed in waste cans, located in the Hazardous Waste Accumulation Area.
- Do not leave oily rags lying on the floor. Linseed oil, in particular, can ignite on its own if left out.

HAZARDOUS WASTE STORAGE & DISPOSAL

- Chemical names must be spelled out.
- Check chemical compatibility before adding waste to a container.
- You should determine if it is:
  - Ignitable
  - Corrosive
  - Reactive
  - Toxic



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Comments:

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Picked Up:

Lastly, Enjoy Your Time in UMass Laboratories

- Research and learning are important, fun and exciting
- EH&S is happy to help you do it safely
- Check our website for further information

  www.ehs.umass.edu
- Contact us at any time with questions

413-545-2682

(put it in your phone)