HAZARD COMMUNICATION TRAINING

PRESENTER: MELISSA TERRY, HAZARDOUS MATERIALS SPECIALIST

ENVIRONMENTAL HEALTH & SAFETY DEPARTMENT

THE UNIVERSITY OF NEW MEXICO

TRAINING OBJECTIVES

1. To introduce the concept of Hazard Communication and its purpose
2. To discuss the five elements of Hazard Communication
3. To go over what to do *before* using a hazardous chemical
4. To learn what to do in case of exposure to a hazardous chemical

WHAT IS HAZARD COMMUNICATION?

- The Occupational Safety & Health Administration (OSHA) promulgated the Hazard Communication Standard (a.k.a. “HazCom”) in 1983 with the understanding that employees have a “Right to Know” about the hazardous chemicals they work with.
- The Hazard Communication Standard was designed to:
  - Reduce the incidence of injuries and illnesses caused by chemical hazards in the workplace
  - Identify and evaluate chemical hazards
  - Establish uniform requirements for communicating information about chemical hazards to all workers

WHAT IS THE PURPOSE OF HAZCOM?

To ensure that all employees know:

- The **hazards** of the chemicals used in the workplace
- The appropriate **personal protective equipment (PPE)** needed when using each chemical
- Where **emergency equipment** is located (safety showers, eyewash stations, alarm pulls, fire extinguishers, spill kits)
- Where to find **safety data sheets (SDSs)** for hazardous chemicals
- The meaning of the different types of hazard communication **labels & symbols**
- What to do if you are **exposed** to a hazardous chemical

THERE ARE FIVE ELEMENTS OF THE HAZARD COMMUNICATION STANDARD

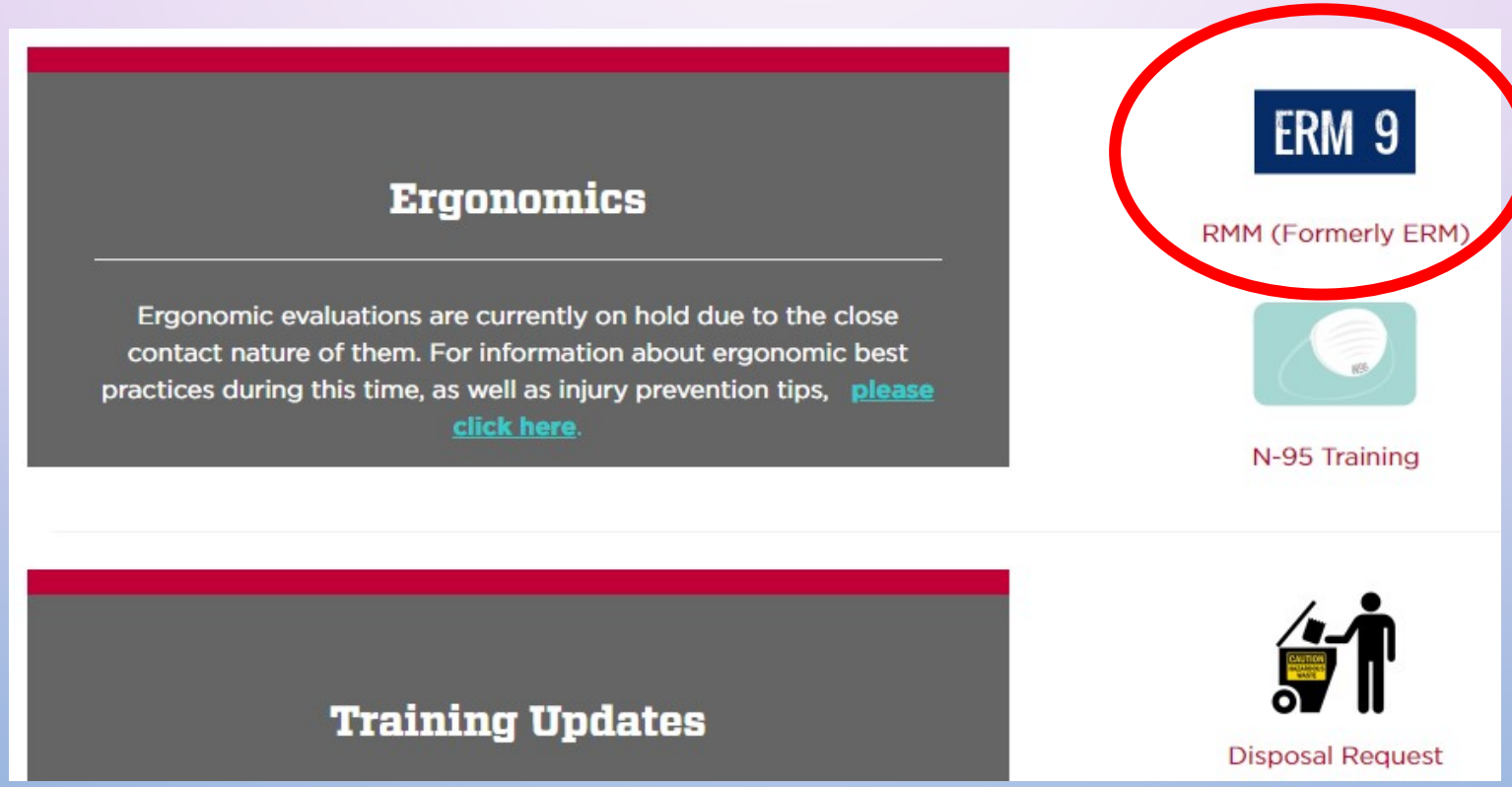
1. Chemical Inventory
2. Labels
3. Safety Data Sheets
4. Training
5. Written Program

HAZCOM ELEMENT #1
CHEMICAL INVENTORY

- Per OSHA, all employers must develop inventories of all hazardous chemicals in the workplace.
- UNM utilizes Research Materials Management (RMM), a web-based chemical inventory program; contact EHS to set up an RMM user account.
- Each laboratory is responsible for maintaining an up-to-date inventory of their chemicals.

CHEMICAL INVENTORY

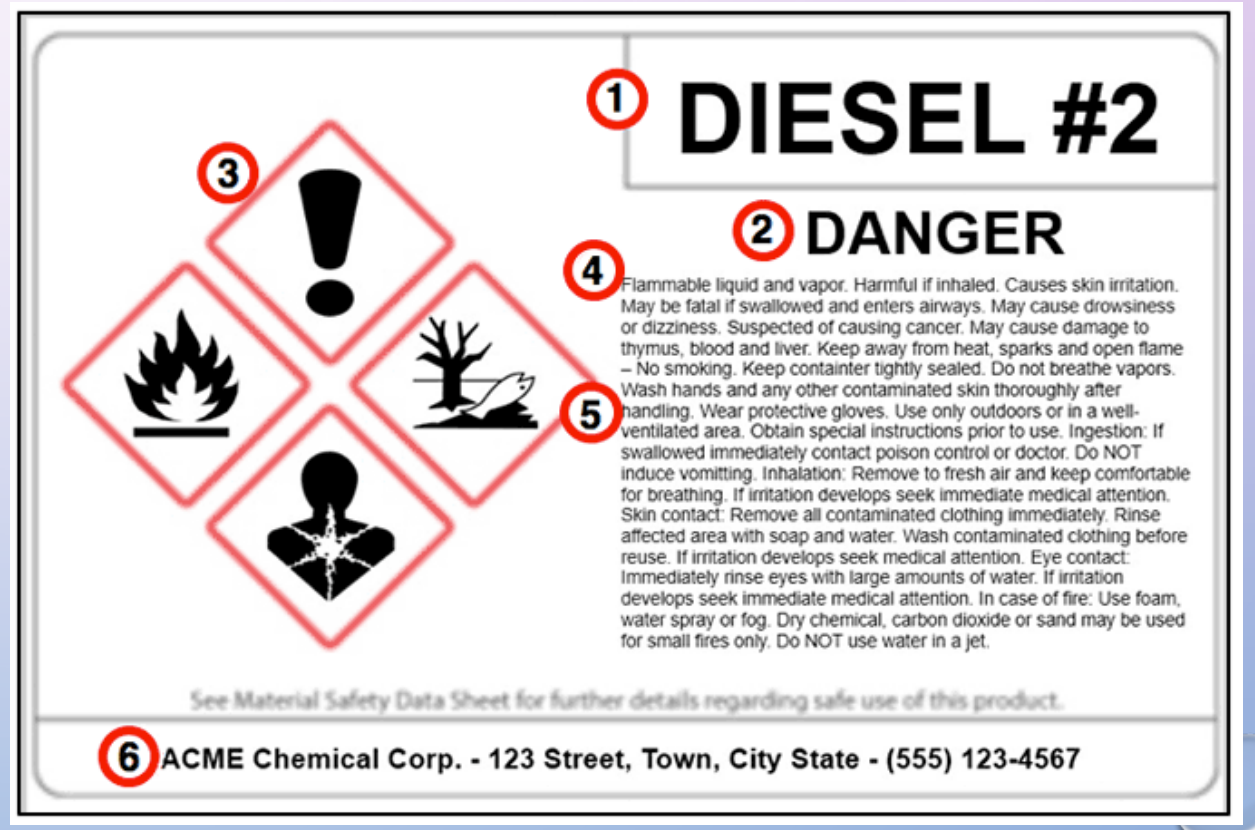
RMM may be accessed via the EHS website, here:



HAZCOM ELEMENT #2
LABELS

Manufacturers of hazardous chemicals must label their product with six pieces of information:

1. Product identifier (name of chemical)
2. Signal word (such as “danger/warning/precaution”)
3. Hazard statement(s)
4. Precautionary statement(s)
5. Pictogram(s)
6. Name, address, telephone number of manufacturer



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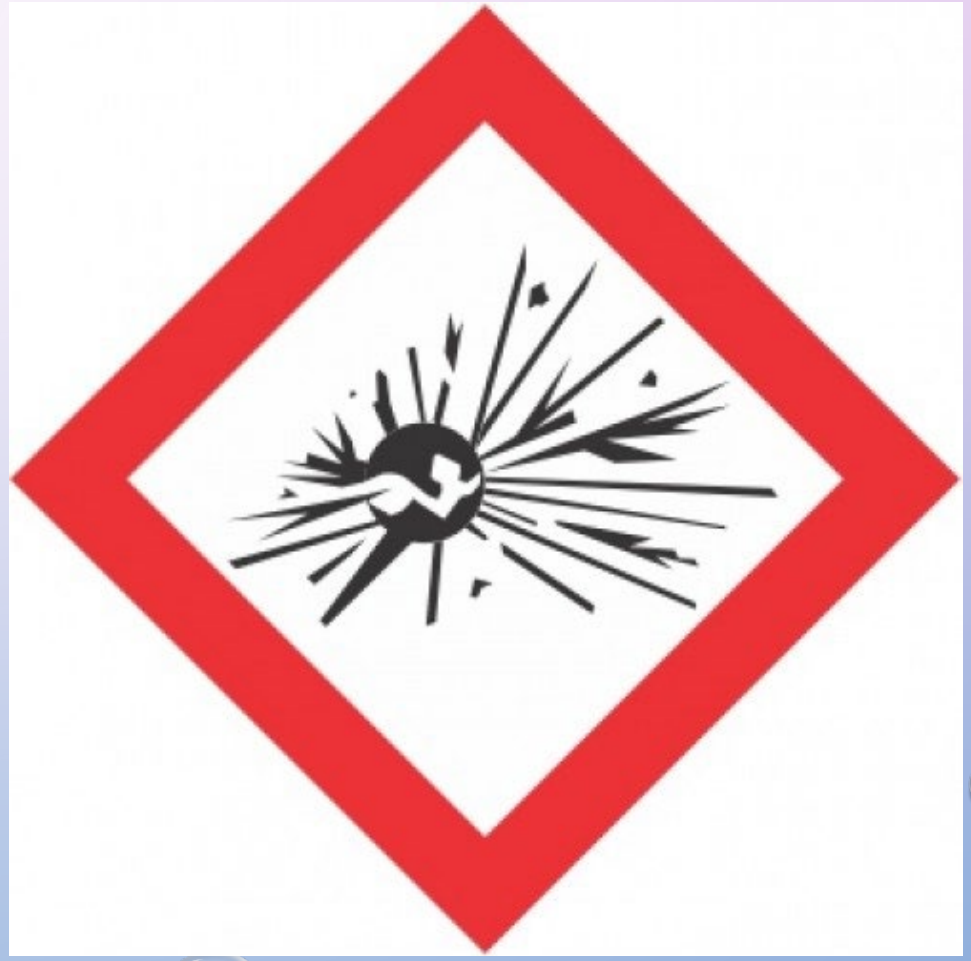
LABELS -- SYMBOLS & PICTOGRAMS

- One part of the hazard communication standard is the use of **symbols or pictograms** to quickly convey hazard information without words
- Hazardous chemicals in the manufacturer's original container will usually have these symbols/pictograms on them
- These symbols are used **internationally** as part of the "Globally Harmonized System" of classification and labelling of chemicals

PICTOGRAM FOR EXPLOSIVE

- Chemicals with this pictogram are unstable
- Explosive hazard
- Severe projection hazard
- May explode in fire
- Examples include fireworks & ammunition



PICTOGRAM FOR FLAMMABLE

- Chemicals with this pictogram are flammable
- Emits flammable vapors
- Self-heating or self-reactive
- Pyrophorics – may ignite when exposed to air
- Examples include solvents and fuels

PICTOGRAM FOR OXIDIZER

- Chemicals with this pictogram are very reactive
- Can burn without air
- May cause or intensify fire
- Keep away from flammable materials
- Examples include hydrogen peroxide >8%, nitric acid, perchlorates

PICTOGRAM FOR COMPRESSED GAS

- Chemicals with this pictogram are pressurized
- Can be compressed, liquefied or dissolved gases
- Must be stored upright and secured at all times
- Must be stored with valve cap when not in use
- Store away from extreme temperatures
- Examples include nitrogen, oxygen, propane & acetylene

PICTOGRAM FOR CORROSIVE

- Chemicals with this pictogram may cause skin corrosion and serious eye damage
- May also cause damage to metals
- Examples include:
  - Acids – hydrochloric, sulfuric, nitric
  - Bases – ammonium hydroxide, sodium hydroxide

PICTOGRAM FOR TOXIC

- Chemicals with this pictogram are toxic
- May cause life threatening effects in small amounts if ingested, inhaled or absorbed through skin
- Examples include:
  - Nicotine
  - Sodium azide
  - Ethidium bromide
  - Heavy metals

EXCLAMATION MARK PICTOGRAM

- Chemicals with this pictogram may be:
  - Irritant to eyes, throat, respiratory tract
  - Skin sensitizer
  - Acutely toxic
  - Narcotic effects
- Examples include:
  - Ammonia
  - Formaldehyde
  - Sulfur dioxide

PICTOGRAM FOR HEALTH HAZARD

- Chemicals with this pictogram may be:
  - Carcinogen (may cause cancer)
  - Mutagen (may cause genetic mutation)
  - Reproductive toxicity
  - Respiratory sensitizer
  - Target organ toxicity (liver, lungs, kidneys, etc.)
- Examples include:
  - Ionizing radiation (x-rays, gamma rays)
  - Certain metals (arsenic, cadmium, chromium)
  - Benzene

OTHER TYPES OF LABELS & SYMBOLS

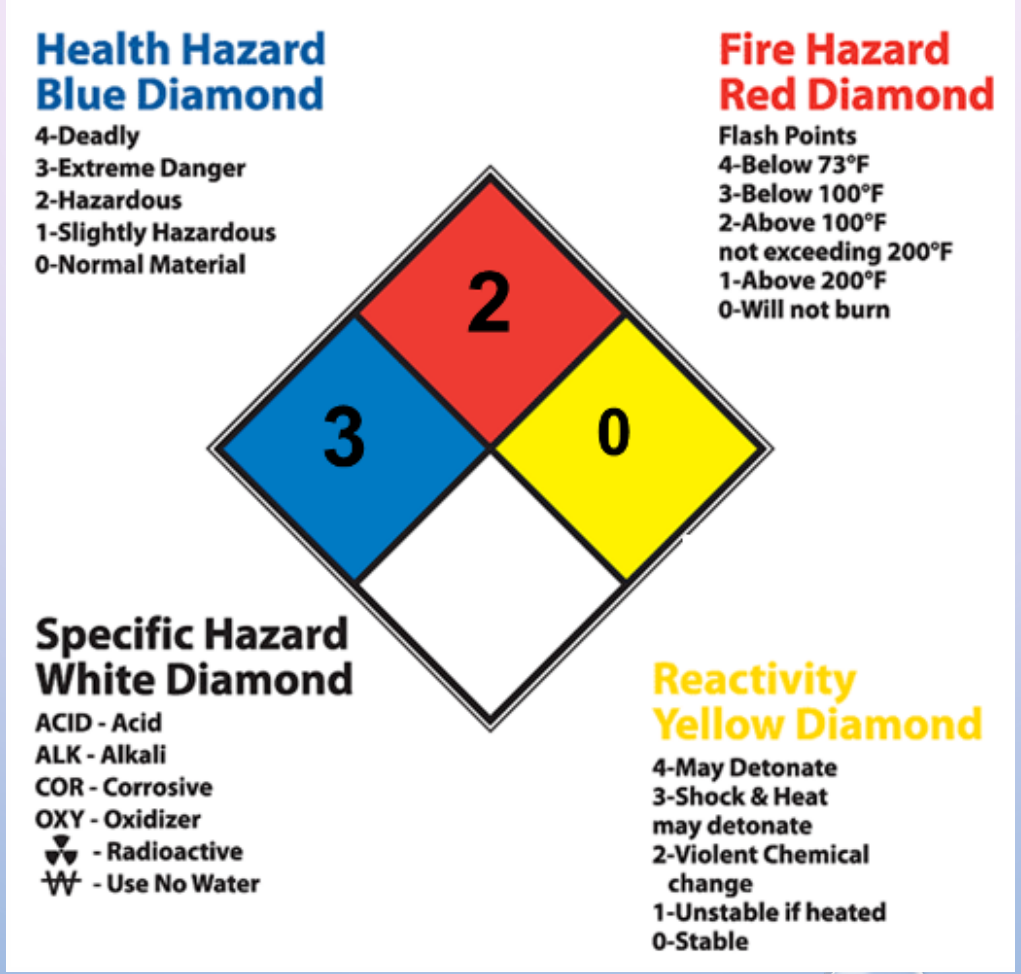
- Biohazardous material or waste is contaminated with biological material that could potentially cause harm/infection/disease to humans, animals or plants
- Examples include:
  - Human and animal blood & tissues
  - Animal carcasses known to be infected with pathogenic organisms
  - Certain bacteria & viruses (E. Coli, Ebola)
  - Used syringes/needles

OTHER TYPES OF LABELS & SYMBOLS

- Materials or waste with this symbol are radioactive
- Exposure to large amounts of radioactivity can cause nausea, hair loss, gastrointestinal and central nervous system damage, DNA damage, cancer & death
- Examples include:
  - Uranium
  - X-rays and gamma rays
  - Naturally-occurring radon gas

OTHER TYPES OF LABELS & SYMBOLS

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) DIAMOND



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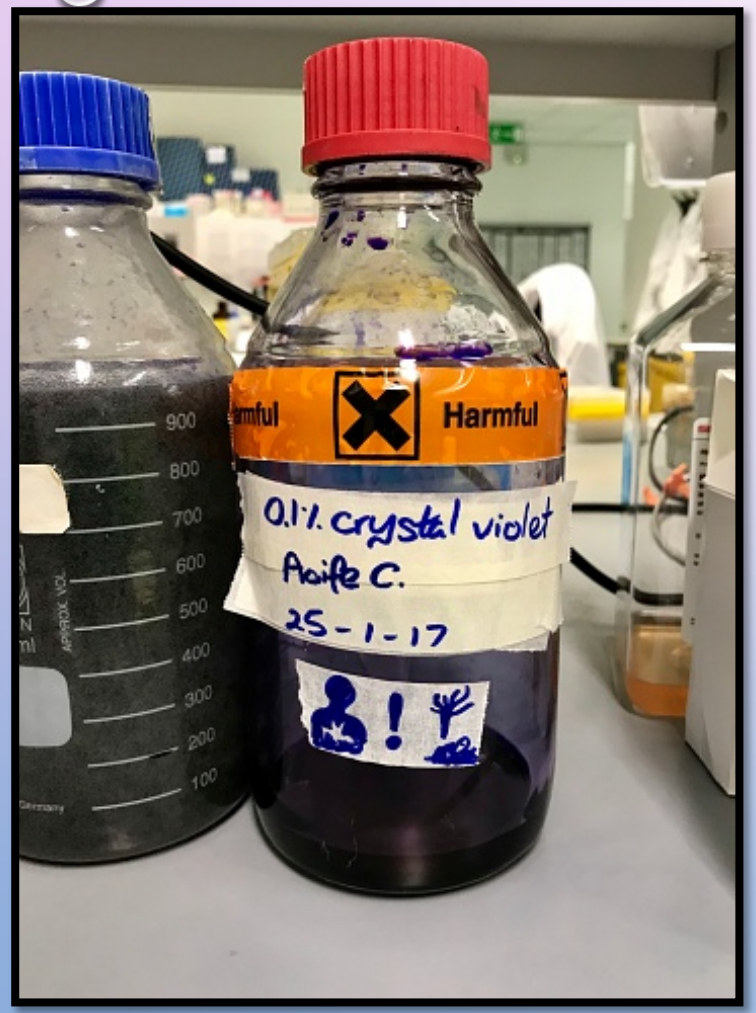
LABELS FOR SECONDARY/WORKPLACE CONTAINERS

***Hazardous chemicals that are transferred from the original container into a secondary or workplace container must, at a minimum, be labeled with the following information*:**

1. **Name of chemical(s)**
2. **Words, pictograms or symbols to convey the hazard(s)**
   - May include printed signs or stickers
   - Handwritten labels are permitted (must be legible and must use permanent ink)

If an inspector from the state or federal government (NMED or EPA) finds improperly labeled chemical containers in your lab, your department will be fined. NMED inspects UNM on a regular basis.

EXAMPLES OF ACCEPTABLE LABELS FOR SECONDARY/WORKPLACE CONTAINERS



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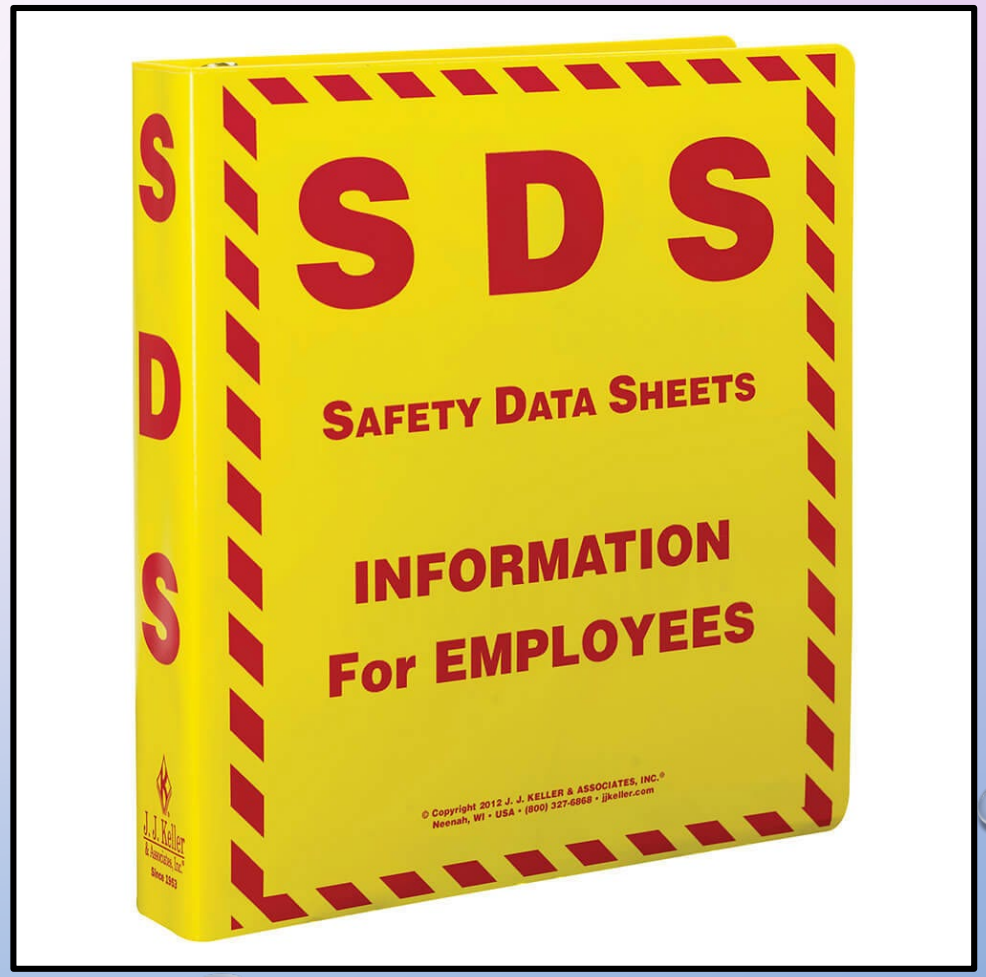
HAZCOM ELEMENT #3
SAFETY DATA SHEETS

- Formerly referred to as Material Safety Data Sheets (MSDS)
- Must be available for all hazardous chemicals in the workplace
- Can be kept electronically on a computer or as hard copies
  - For quick access, store hard copies in alphabetical order
- Can be found on EHS home page by clicking on “Chemwatch” icon
- Can also be found by doing a simple internet search



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SAFETY DATA SHEETS (SDSs)

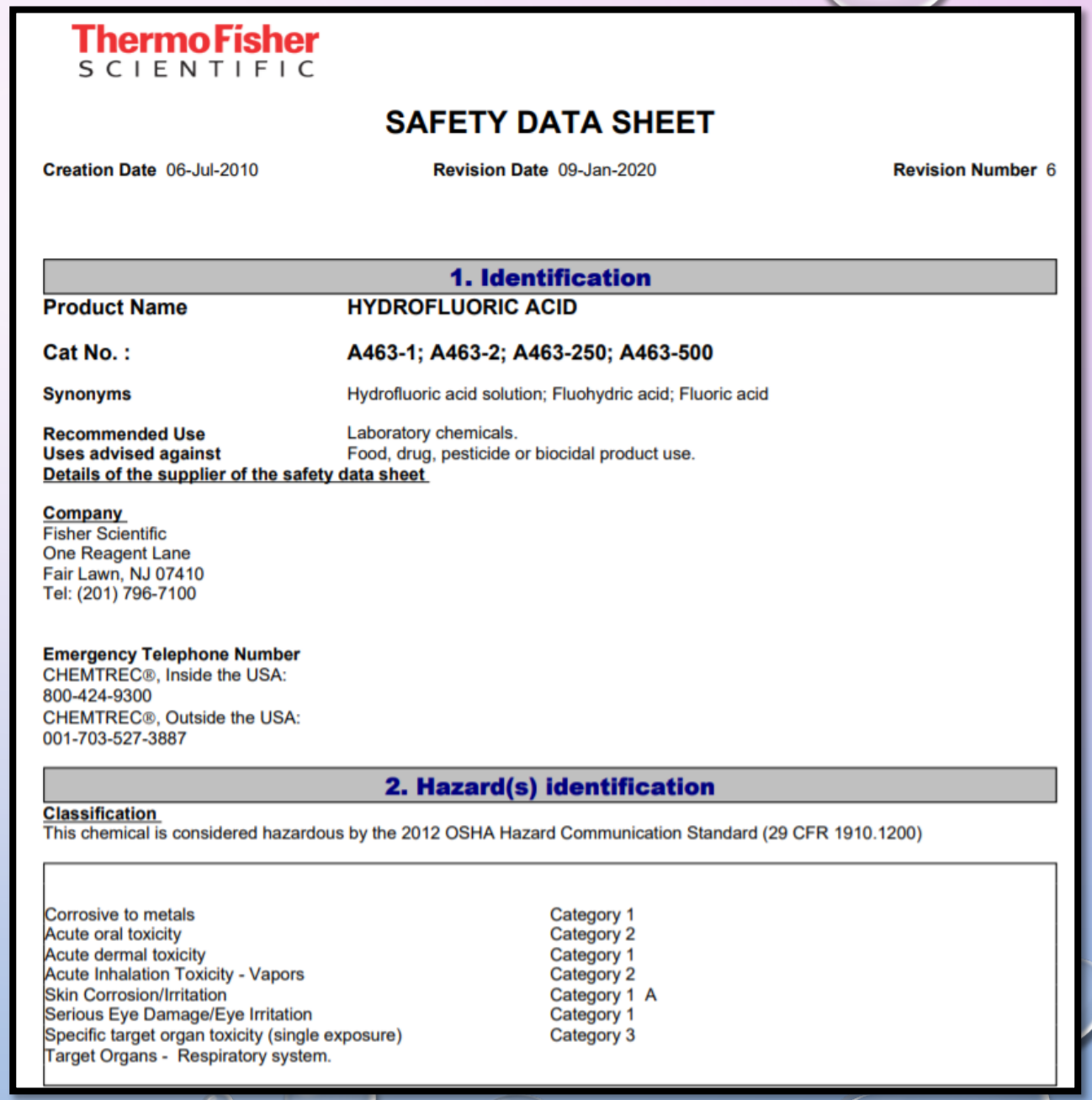
SDSs ARE COMPRISED OF THE FOLLOWING 16 SECTIONS:

- Section 1 – Product & manufacturer identification
- **Section 2 – Hazards identification**
- Section 3 – Composition/information on ingredients
- **Section 4 – First aid measures**
- Section 5 – Fire-fighting measures
- Section 6 – Accidental release measures
- **Section 7 – Handling & storage**
- **Section 8 – Exposure controls/personal protection**

SAFETY DATA SHEETS (SDSs)

- Section 9 – Physical & chemical properties
- Section 10 – Stability & reactivity
- Section 11 – Toxicological information
- Section 12 – Ecological information
- **Section 13 – Disposal considerations**
- Section 14 – Transport information
- Section 15 – Regulatory information
- Section 16 – Other information

SDS for Hydrofluoric Acid manufactured by ThermoFisher (Sections 1 and 2 only)



ThermoFisher SCIENTIFIC

SAFETY DATA SHEET

Creation Date 06-Jul-2010 **Revision Date** 09-Jan-2020 **Revision Number** 6

1. Identification

Product Name HYDROFLUORIC ACID

Cat No. : A463-1; A463-2; A463-250; A463-500

Synonyms Hydrofluoric acid solution; Fluohydric acid; Fluoric acid

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number
CHEMTREC®, Inside the USA:
800-424-9300
CHEMTREC®, Outside the USA:
001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1
Acute oral toxicity	Category 2
Acute dermal toxicity	Category 1
Acute Inhalation Toxicity - Vapors	Category 2
Skin Corrosion/Irritation	Category 1 A
Serious Eye Damage/Eye Irritation	Category 1
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	

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SDS for Hydrofluoric Acid (Sections 7 & 8 only)

HYDROFLUORIC ACID **Revision Date** 09-Jan-2020

Up

7. Handling and storage

Handling Wear personal protective equipment/face protection. Do not get in eyes, on skin, or on clothing. Use only under a chemical fume hood. Do not breathe mist/vapors/spray. Do not ingest.

Storage Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area. Do not store in metal containers.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Hydrogen fluoride	TWA: 0.5 ppm TWA: 2.5 mg/m³ Ceiling: 2 ppm Skin	(Vacated) TWA: 3 ppm (Vacated) TWA: 2.5 mg/m³ (Vacated) STEL: 6 ppm TWA: 3 ppm	IDLH: 30 ppm IDLH: 250 mg/m³ TWA: 3 ppm TWA: 2.5 mg/m³ Ceiling: 6 ppm Ceiling: 5 mg/m³	TWA: 0.5 ppm TWA: 2.5 mg/m³ Ceiling: 2 ppm

Legend

ACGIH *- American Conference of Governmental Industrial Hygienists*
OSHA *- Occupational Safety and Health Administration*
NIOSH IDLH: *NIOSH - National Institute for Occupational Safety and Health*

Engineering Measures Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection Tight sealing safety goggles. Face protection shield.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

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HAZCOM ELEMENT #4
TRAINING

- Employers are **required** to provide training on hazardous chemicals in the workplace
- Training should occur:
  - Before the employee's initial assignment
  - When new hazards are introduced
  - For non-routine tasks
- Training should include:
  - Methods to determine the presence of a leak or release of chemicals
  - Hazards of the chemicals employees may be exposed to
  - Appropriate hazard controls (fume hoods, SOPs, PPE)
  - Where and how to obtain additional information

HAZCOM ELEMENT #5
WRITTEN HAZCOM PROGRAM

- Employers are obligated to have a written Hazard Communication Program that outlines the protocols and procedures for employees handling hazardous chemicals in their facility, as well as information about specific risks, SDS access information, emergency procedures, and any other information necessary to minimize the occurrence of a physical or health hazard to an employee.
- EHS is currently updating UNM's Hazard Communication Program and it will be available on the EHS website by April 2021.

WHAT TO DO *BEFORE* YOU USE A HAZARDOUS CHEMICAL

- Read the SDS, which will tell you:
  - The hazards of the chemical
  - The PPE you need to use
  - First aid measures if you are accidentally exposed
- Know where emergency response equipment is located
  - If you are working alone or in an area where emergency response equipment is not nearby, make sure you have access to a phone and make sure someone knows where you are
- Know what to do if you are accidentally exposed to the chemical

WHAT TO DO IF YOU ARE EXPOSED TO A HAZARDOUS CHEMICAL

- Immediately wash the exposed area with soap & water
- If you feel ill or have any injuries from the exposure, go to Employee Occupational Health Services (EOHS) if you are a UNM employee or go to Student Health & Counseling (SHAC) if you are a student
  - EOHS is located in the Family Practice Center (Bldg #248), 2400 Tucker Avenue NE
  - SHAC is located on Main Campus (Bldg #73), just north of Johnson Center
  - If possible, bring a copy of the SDS with you
- Notify your supervisor and complete these three forms:
  - Notice of accident form
  - First report of accident form
  - Medical authorization form
- Submit the completed forms to UNM Risk Services

REFERENCES

- OSHA Hazard Communication Standard, 29 CFR 1910.1200, www.OSHA.GOV/HAZCOM
- OSHA Globally Harmonized System, www.OSHA.GOV/DSG/HAZCOM/GLOBAL.HTML
- UNM Chemical Hygiene Plan

QUESTIONS?

For questions about hazardous chemicals,

call or email Melissa Terry

505-277-1058

melterry@unm.edu

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HAZARDOUS WASTE MANAGEMENT FOR LABS, STUDIOS & MAKERSPACES

Environmental Health & Safety

Melissa Terry – Hazardous Materials Specialist

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HAZARDOUS WASTE MANAGEMENT

Course Objectives:

- To define hazardous waste
- To know the four characteristics of hazardous waste
- To know your responsibilities as someone who generates hazardous waste
- To learn how to properly store and label hazardous waste
- To request a pickup of hazardous waste
- To see some examples of what you don't want inspectors to find

WHAT IS HAZARDOUS WASTE?

- A material is considered “waste” when it is no longer wanted and is destined for disposal.
- A waste that poses a substantial or potential threat to public health or the environment is considered a “hazardous waste”.
- Hazardous waste includes materials such as household cleaning products, pesticides, paints, fuels, pharmaceuticals and laboratory chemicals.

THE 4 HAZARDOUS CHARACTERISTICS

Waste is considered HAZARDOUS if it exhibits one or more of the following characteristic properties:

- **IGNITABLE/FLAMMABLE** – waste liquids that have flash points less than 140 ºF (60 ºC), or solids that are spontaneously combustible. Examples: spent solvents and rags with spent solvents.
- **CORROSIVE** -- wastes with a pH ≤ 2 or ≥ 12.5 (acids & bases) and/or are capable of corroding metal containers. Examples: nitric, sulfuric, hydrochloric acids and ammonium, potassium, sodium hydroxides.
- **REACTIVE** -- wastes that are unstable under normal conditions and can cause explosions, undergo violent reactions or generate toxic fumes when heated, compressed or mixed with water. Examples: lithium-sulfur batteries, sodium metal, cyanide and sulfide-bearing wastes, ethers and peroxides.
- **TOXIC** -- wastes that are harmful or fatal when ingested or absorbed. Examples: mercury, lead, arsenic, methyl ethyl ketone, vinyl chloride, benzene and chloroform.





YOUR RESPONSIBILITIES

As someone who works in a lab where hazardous waste is generated, it is your responsibility:

- **To ensure all wastes are STORED PROPERLY**
- **To ensure all waste containers are LABELED PROPERLY**
- **To ensure all waste is DISPOSED OF PROPERLY**

PROPER STORAGE OF HAZARDOUS WASTE

Any lab/studio/shop/makerspace where hazardous waste is generated is considered a Satellite Accumulation Area (SAA) by EPA. To remain compliant with EPA's SAA regulations, you MUST:

- Store waste in the **same room** where it was generated
- Store incompatible wastes separately (acids & bases, oxidizers, flammables)
- Keep waste containers **closed** unless adding to them
  - A funnel in the mouth of a waste container is **NOT** a closed container
- Never accumulate more than 55 gallons of hazardous waste or 1 quart/1kg/2.2 lbs. of *acutely* hazardous waste in your lab (this is anything on the EPA's P-list)

PROPER LABELING OF HAZARDOUS WASTE

To remain compliant with EPA's SAA regulations, you must ensure that all containers of hazardous waste have the following 3 pieces of information on the label:

1. The words "**HAZARDOUS WASTE**".

2. A **list of the contents** of the container, with concentrations/volumes/percentages of each constituent.

3. **Words or pictograms** that communicate **the hazards** of the waste.

PROPER LABELING OF HAZARDOUS WASTE

PLEASE NOTE

- **You *MUST* add an appropriate label to a hazardous waste container AS SOON AS YOU BEGIN ADDING HAZARDOUS WASTE TO THE CONTAINER.**

- **Do not wait until you are ready for a hazardous waste pickup to label your hazardous waste containers.**

PROPER LABELING OF HAZARDOUS WASTE

PLEASE NOTE

If you have a hazardous chemical in its original container, with the manufacturer's label intact, you only need to add the words "HAZARDOUS WASTE" to it. (example on next slide)

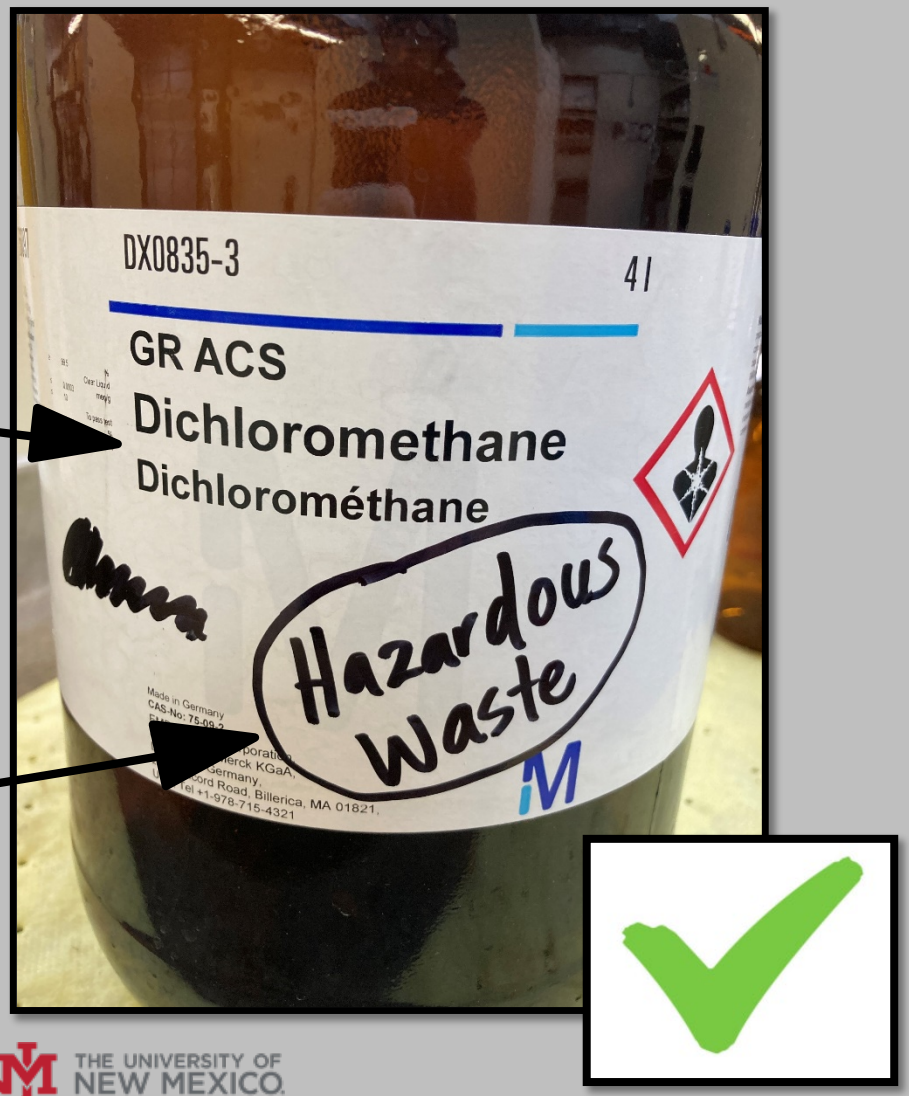
- **Handwritten is acceptable**
- **Labels you create and print yourself are acceptable**
- ***The original label must not be obscured***

PROPER LABELING OF HAZARDOUS WASTE

For example…

Original label

Words “Hazardous Waste” written legibly, not obscuring original label

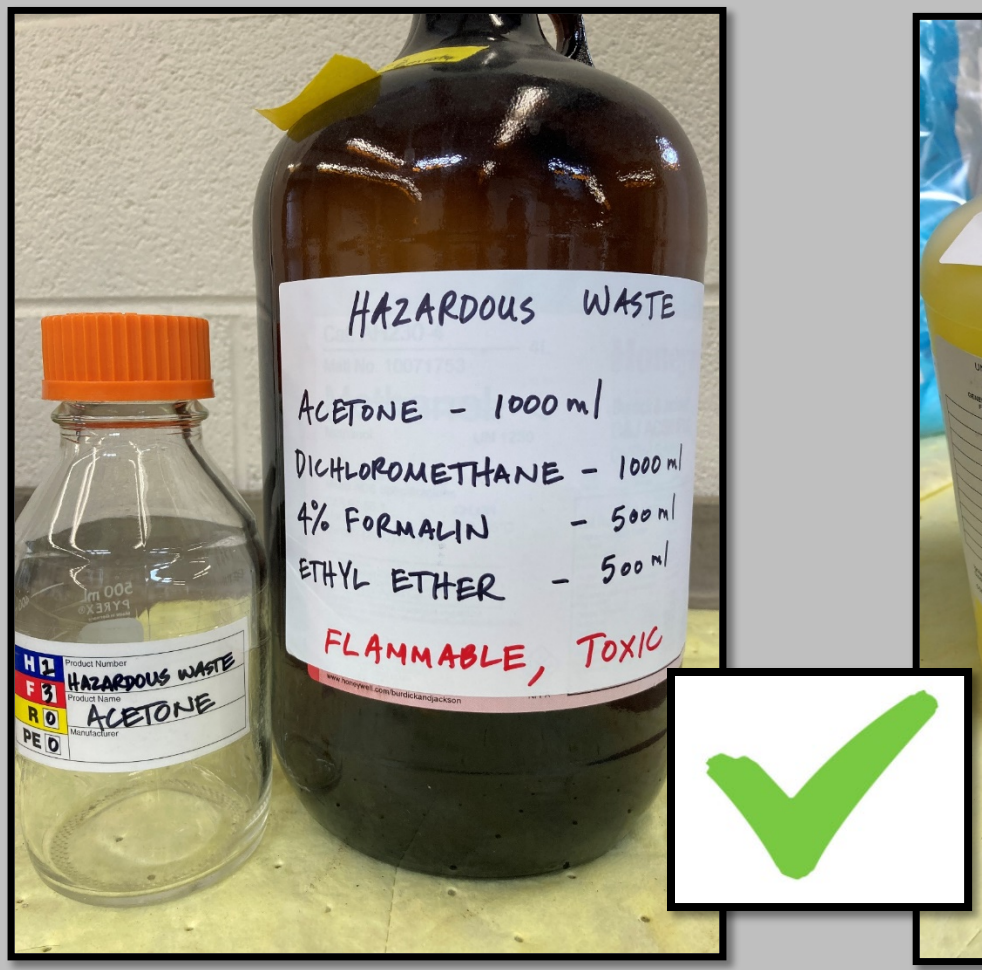


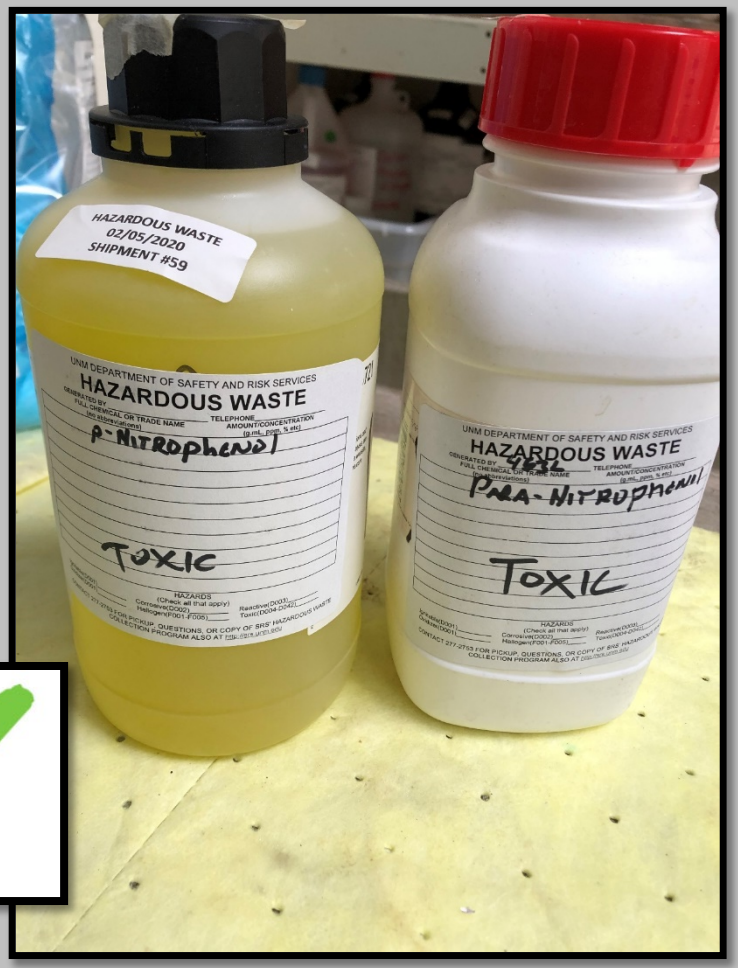
PROPER LABELING OF HAZARDOUS WASTE

If you have a hazardous chemical that is NOT in its original container, you need to ADD A LABEL that includes the three pieces of info mentioned previously. (examples on next slide)

- **Handwritten labels are acceptable**
- **Labels you create and print yourself are acceptable**
- **NFPA color-coded labels and GHS pictograms are acceptable**


PROPER LABELING OF HAZARDOUS WASTE





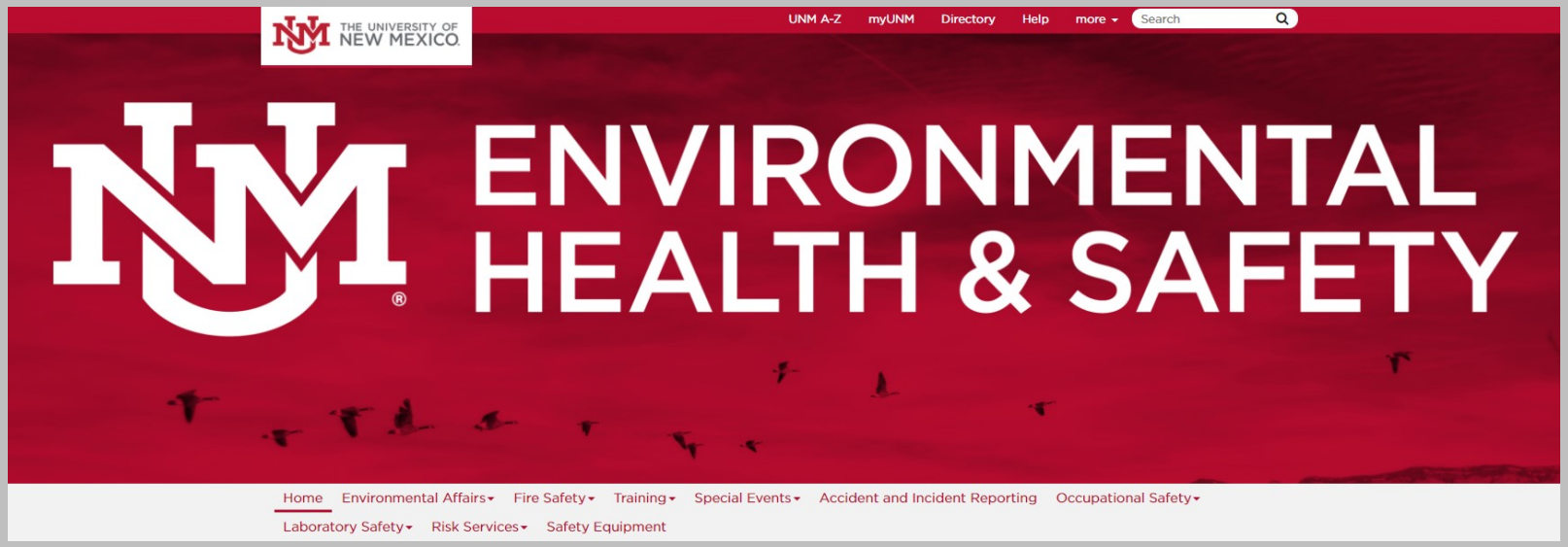
PROPER DISPOSAL OF HAZARDOUS WASTE

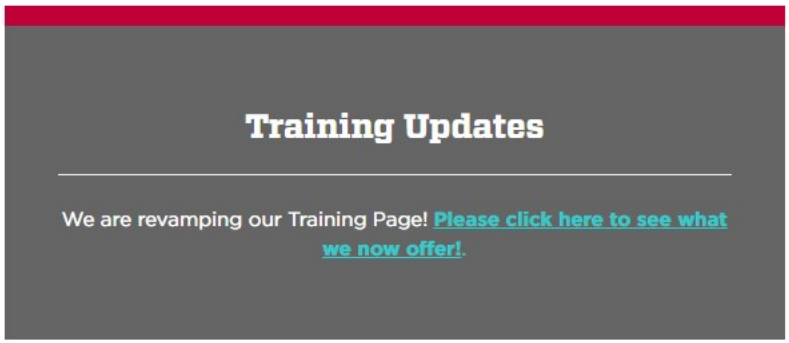
How do I get rid of chemical and/or hazardous waste?

When you have unwanted/excess/expired chemicals and/or hazardous waste you need to get rid of, you must:

1. Fill out a Chemical Waste Pickup Request form
2. Email the form to chemsafety-L@list.unm.edu
    1. You will receive an email confirming receipt of your request and informing you of the next pickup date
3. Prepare your containers for pickup
    1. Double-check that all containers are properly labeled
    2. Improperly labeled containers will not be picked up
4. Be available to provide access to the containers on pickup day
    1. UNM utilizes the services of a chemical transport company to conduct the pickups and this company does not have keys to any UNM buildings

PROPER DISPOSAL OF HAZARDOUS WASTE





WASTE DISPOSAL

Request for Pick-up of Hazardous Waste and Excess Chemicals

Environmental Health and Safety arranges for the proper transportation and disposal of excess chemicals and hazardous wastes generated at UNM. In order to have your wastes picked up, fill out a Hazardous Materials Pickup Request Form and email it to chemsafety-L@list.unm.edu. You will receive an email from our Hazardous Materials Specialist confirming receipt of your request and you will be added to the hazardous materials pick-up schedule. Pick-ups are typically every Wednesday.

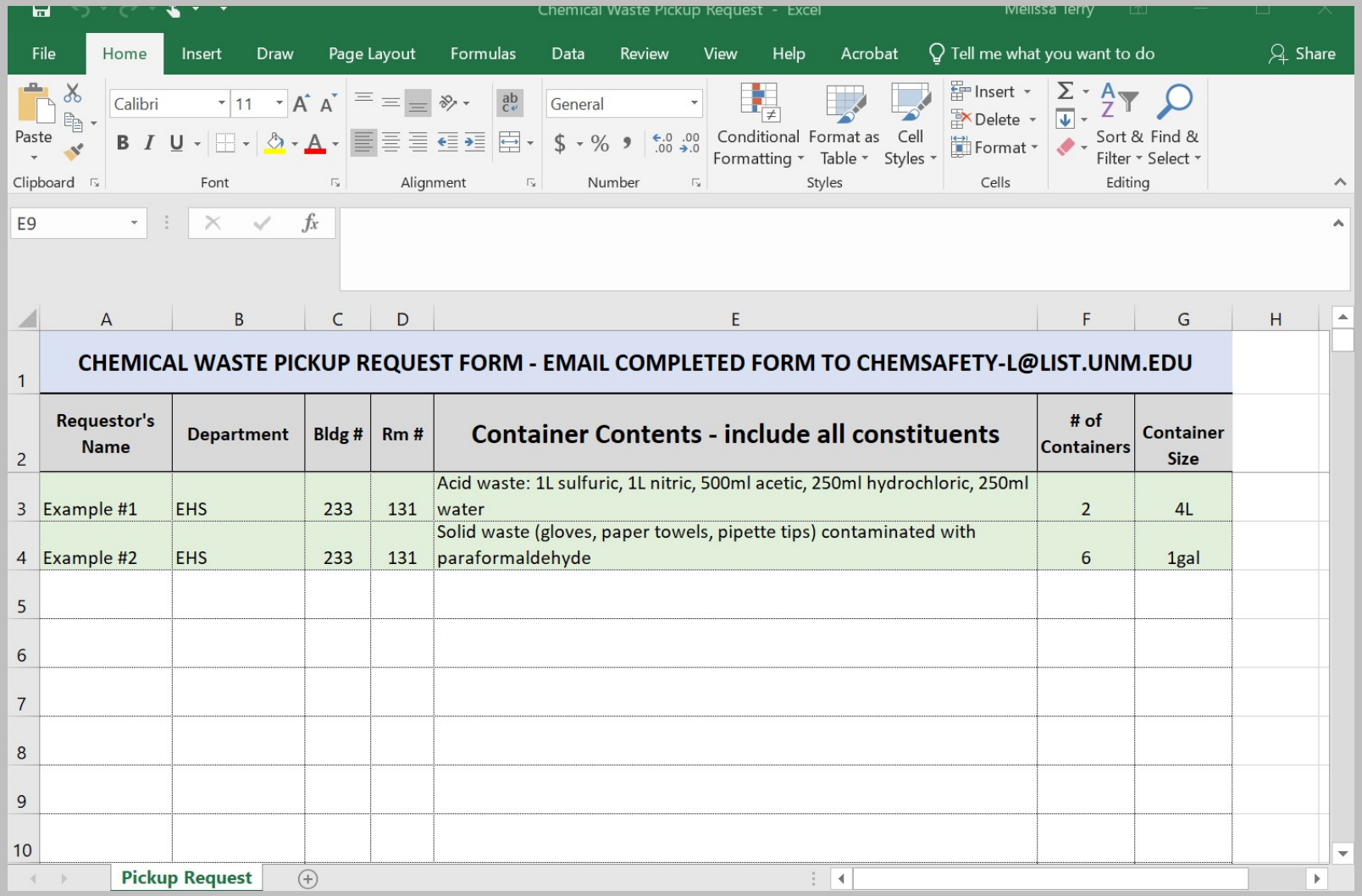
Prior to being picked up, you must ensure that all waste containers are properly labeled. If waste is in its original container and the label is intact, no additional labeling is necessary. If waste is not in its original container, it must be labeled with the following information:

1. The words "HAZARDOUS WASTE".
2. The words "TOXIC," "REACTIVE," "IGNITABLE," and/or "CORROSIVE," if applicable.
3. A list of the contents of the container (with percent or volume of each ingredient).
4. Your Building Name and Room Number

You may use the EHS Editable Hazardous Waste Label or you may create your own label, as long as it contains the information listed above.

If you have questions related to hazardous waste and/or excess chemicals disposal, please contact Environmental Health and Safety at 277-2753.

WASTE DISPOSAL



Chemical Waste Pickup Request - Excel

	A	B	C	D	E	F	G	H
1	CHEMICAL WASTE PICKUP REQUEST FORM - EMAIL COMPLETED FORM TO CHEMSAFETY-L@LIST.UNM.EDU							
2	Requestor's Name	Department	Bldg #	Rm #	Container Contents - include all constituents	# of Containers	Container Size	
3	Example #1	EHS	233	131	Acid waste: 1L sulfuric, 1L nitric, 500ml acetic, 250ml hydrochloric, 250ml water	2	4L	
4	Example #2	EHS	233	131	Solid waste (gloves, paper towels, pipette tips) contaminated with paraformaldehyde	6	1gal	
5								
6								
7								
8								
9								
10								

Pickup Request

WASTE DISPOSAL

HAZARDOUS WASTE

BUILDING #_____ ROOM #_____

CHEMICAL NAME	AMOUNT/CONCENTRATION

☐ IGNITABLE ☐ CORROSIVE ☐ REACTIVE ☐ TOXIC

HAZARDOUS WASTE

BUILDING #_____ ROOM #_____

CHEMICAL NAME	AMOUNT/CONCENTRATION

☐ IGNITABLE ☐ CORROSIVE ☐ REACTIVE ☐ TOXIC

HAZARDOUS WASTE

BUILDING #_____ ROOM #_____

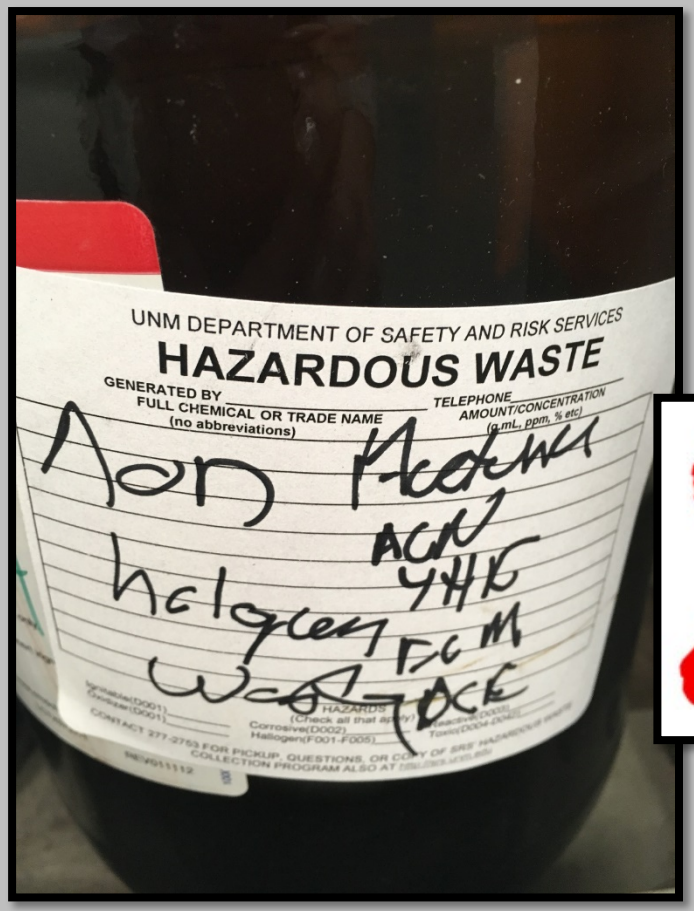
CHEMICAL NAME	AMOUNT/CONCENTRATION

HAZARDOUS WASTE

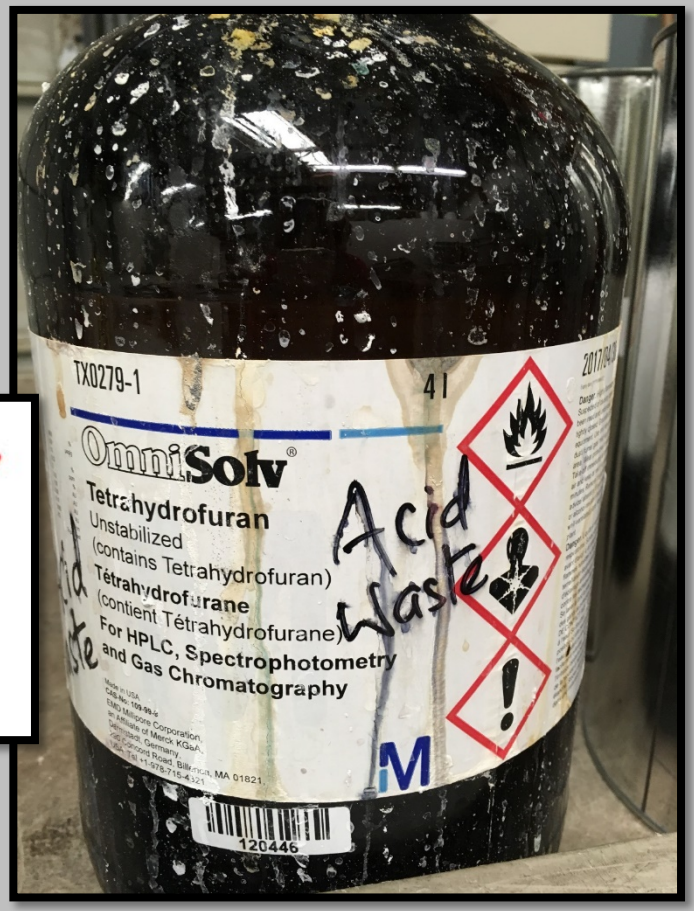
BUILDING #_____ ROOM #_____

CHEMICAL NAME	AMOUNT/CONCENTRATION

NO-NOs – Things You Don't Want an Inspector to Find

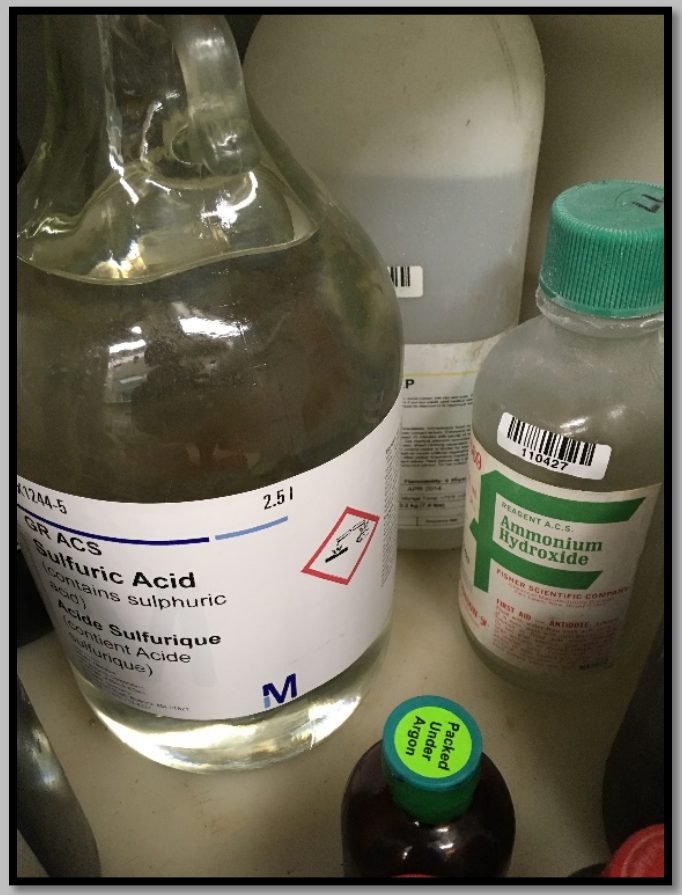


IMPROPER LABELING



IMPROPER LABELING

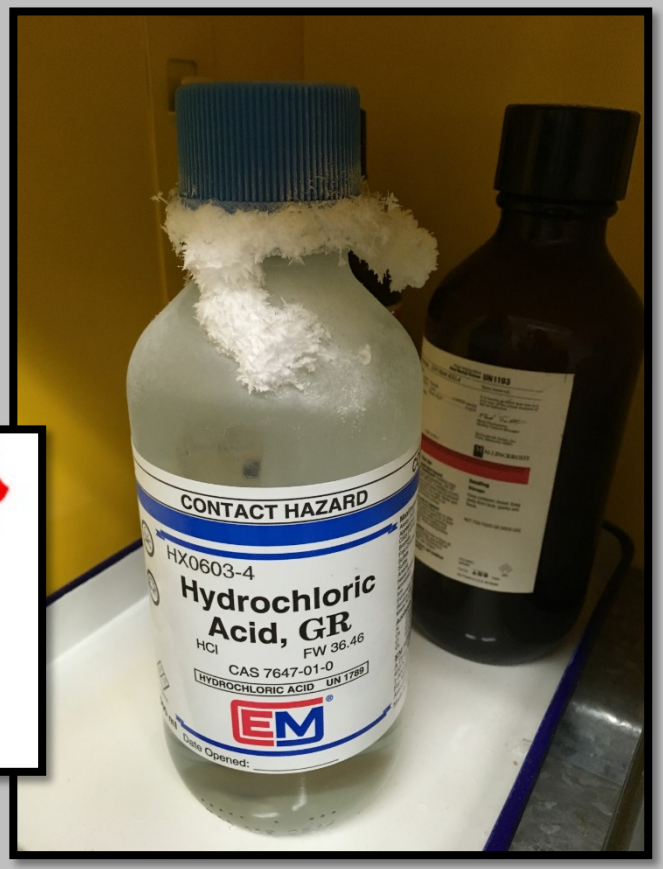
NO-NOs – Things You Don't Want an Inspector to Find



IMPROPER STORAGE – acids and bases together

IMPROPER STORAGE – flammables stored under sink, on floor

NO-NOs – Things You Don't Want an Inspector to Find

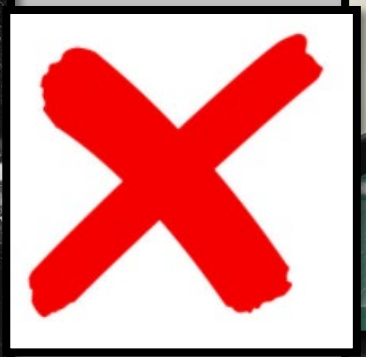


OVERFILLED CONTAINERS

LEAKY CONTAINERS

NO-NOs – Things You Don't Want an Inspector to Find

POOR LAB HYGIENE



POOR HOUSEKEEPING

DON'T GET FINED

In March 2016, the New Mexico Environment Department conducted unannounced inspections at several UNM buildings and subsequently issued fines totaling over one hundred and three thousand dollars.

$103,420!

Fines are paid by the departments where the violations were found.

FAQs

Can I pour this down the drain?

- No. The ABCWUA's Sewer Ordinance prohibits putting flammables, corrosives, oil & grease, hydrocarbons, materials that impart color (dyes) and radioactive materials into the sewer system.

What do I do with my empty containers?

- List your empty containers on a Chemical Waste Pickup Request form and they will be picked up by EHS or the EHS chemical pickup vendor.
- Be sure to record the barcode sticker number and remove the container from your ERM inventory.

FAQs

What do I do with broken glass?

- Broken glass that has not been in contact with infectious or acutely hazardous waste must be disposed of in a rigid, puncture-resistant container which was manufactured for the purpose of sharps containment. Tape the lid so it is tightly closed and place it in the dumpster in your building.
- Broken glass that is contaminated with infectious waste must be disposed of as biohazardous waste in an appropriate sharps container.
- Broken glass that is contaminated with acutely hazardous waste must be disposed of as hazardous waste through EH&S after placement in a rigid, puncture-resistant container and taped closed.

Does EH&S provide waste containers?

- Yes. EH&S has a small supply of previously-used containers that are available for reuse as waste containers.

THE END

Questions?

Environmental Health & Safety

University of New Mexico

277-2753

http://EH&S.unm.edu