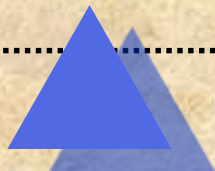




MIOSHA Regulations Covered in this Training Session

- ◆ Hazard Communication Standard
- ◆ Personal Protective Equipment Standard
- ◆ Laboratory Safety Standard





Occupational Safety and Health Regulations

- ◆ Federal Department of Labor
 - ◆ Federal OSHA Regulations
 - ◆ State of Michigan Department of Consumer and Industry Services
 - ◆ Michigan Occupational Safety and Health Act (MIOSHA)
- 

Introduction to the Hazard Communication Standard





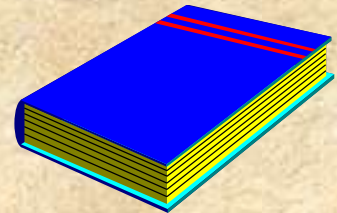
Purpose of the Hazard Communication Standard (Right to Know)

- ◆ To assure that employees are provided with the information they need to handle hazardous materials and equipment safely.
- 



Requirements of the Hazard Communication Standard

- ◆ Written HazCom Program
- ◆ Hazardous Chemical Evaluation
- ◆ List and Label Hazardous Chemicals
- ◆ Chemical Safety Information Available
- ◆ Employee Training
- ◆ Recordkeeping
- ◆ Anti-discrimination Clause



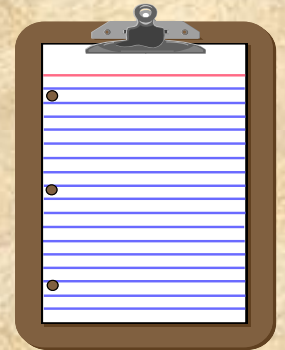


No Discrimination

Employees are protected
from discrimination or discharge
resulting from a request for
information regarding hazardous
chemicals under the
Hazard Communication
(Right-to-Know) law.

Hazardous Chemical List

- ◆ Include all hazardous chemicals found in your work area
- ◆ Maintain up-to-date copy identifying:
 - Chemical name
 - Maximum potential quantity
 - Storage location
- ◆ Available to employees
- ◆ Can be useful to emergency response personnel



Hazardous Chemicals



- ◆ Strong Acids and Bases
- ◆ Flammable solvents: acetone, ethanol
- ◆ Toxics: formaldehyde, acetonitrile, ethidium bromide, phenol, silane
- ◆ Carcinogens: acrylamide, osmium tetroxide
- ◆ Compressed gases

Container Labeling

- ◆ Manufacturer must label
 - Bulk chemical containers
- ◆ Lab personnel must label
 - Secondary containers
- ◆ Label must include full chemical name, concentration and the primary hazard
- ◆ Deface & triple rinse empty chemical containers for disposal



HEALTH HAZARD

4	Deadly
3	Extreme Danger
2	Hazardous
1	Slightly Hazardous
0	Normal Material

FIRE HAZARD

Flash Points

4	Below 73 F
3	Below 100 F
2	Below 200 F
1	Above 200 F
0	Will not burn



SPECIFIC HAZARD

OX	Oxidizer
ACID	Acid
ALK	Alkali
COR	Corrosive
W	Use NO WATER
	Radiation Hazard

REACTIVITY

4	May Detonate
3	Shock/Heat May Detonate
2	Violent Chemical Change
1	Unstable If Heated
0	Stable

Warning Labels



Methanol

CH_3OH



Methanol

CH_3OH



Methanol

CH_3OH



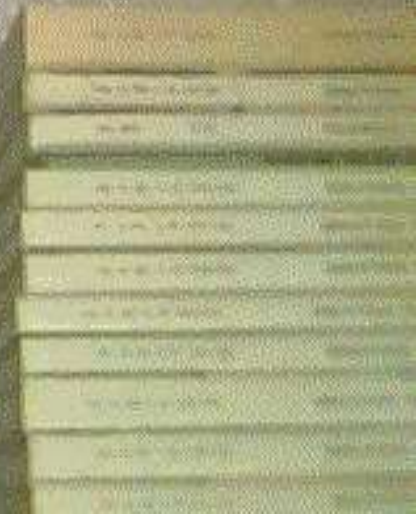
METHANOL

FLAMMABLE

LAB AIR

NATURAL GAS

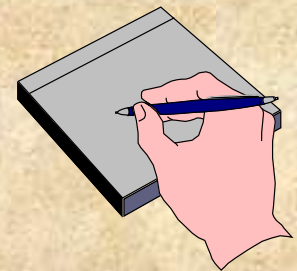
LAB NITROGEN



What Training is Required?

- ◆ Baseline Training = this class
- ◆ Work Specific Training = instruction you receive from your supervisor

Maintain records for all training



Material Safety Data Sheets (MSDS)

- ◆ Primary resource for chemical hazard communication
- ◆ For every hazardous chemical
- ◆ Available online
- ◆ Locator poster required
- ◆ Standard information required by the regulation will be contained in the MSDS



This Workplace Covered by the Michigan Right To Know Law



Employers must make available for employees in a readily accessible manner, Material Safety Data Sheets (MSDS)* for those hazardous chemicals in their workplace.

Employees cannot be discharged or discriminated against for exercising their rights including the request for information on hazardous chemicals.

Employees must be notified and given direction (by employer posting) for locating Material Safety Data Sheets and the receipt of new or revised MSDS(S).

*Employees may also request MSDS from the Michigan Department of Consumer & Industry Services, Bureau of Safety & Regulation, Occupational Health Division, 7150 Harris Dr., PO Box 30649, Lansing, Michigan 48909-8149, (517) 322-1608.



Michigan Occupational Safety and Health Act



"Serving Michigan...Serving You"

Michigan Department of Consumer & Industry Services

MSDS(s) For This Workplace Are Located At

Location(s)

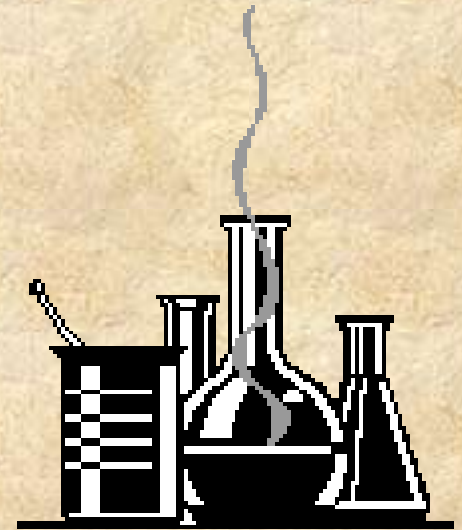
Location(s)

Person(s) responsible for MSDS(S)

Phone

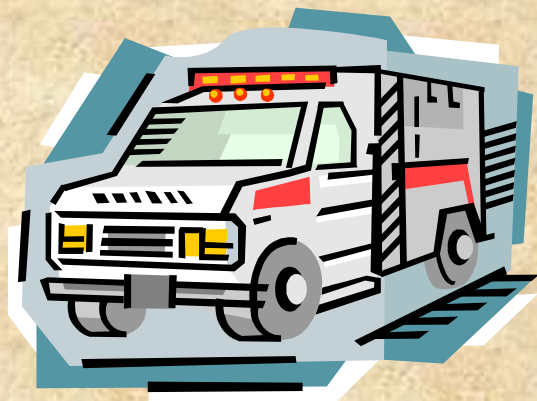
What information will be in the MSDS?

- ◆ Substance Identification and Synonyms
- ◆ Hazardous Components (if mixture)
- ◆ Physical Data: appearance, melting point
- ◆ Fire & Explosion Data: flash-point, LEL
- ◆ Toxicity Data: LD50's, carcinogenicity



MSDS Information (Cont'd)

- ◆ Health Effects & First Aid
- ◆ Reactivity: incompatibilities
- ◆ Storage & Disposal Procedures
- ◆ Spill & Leak Procedures
- ◆ Protective Equipment



Methylene Chloride

MSDS

Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

METHYLENE CHLORIDE

MSDS Number: M4420 --- *Effective Date: 05/17/01*

1. Product Identification

Synonyms: MC; Dichloromethane (DCM); Methylene dichloride; Methylene bichloride; Methane dichloride

CAS No.: 75-09-2

Molecular Weight: 84.93

Chemical Formula: CH₂Cl₂

Product Codes: 9264, 9266, 9295, 9315, 9324, 9329, 9330, 9341, 9348, 9350, 9965, Q480

Composition/Hazards

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Methylene Chloride	75-09-2	> 99%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER, CARDIOVASCULAR SYSTEM, AND BLOOD. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.

J.T. Baker SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Cancer Causing)

Flammability Rating: 1 - Slight

Reactivity Rating: 1 - Slight

Contact Rating: 2 - Moderate

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: Blue (Health)

Exposure Limits

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Outside or detached storage is recommended. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. To minimize decomposition, all storage containers should be galvanized or lined with a phenolic coating. This material may corrode plastic and rubber. Wear special protective equipment (Sec. 8) for maintenance break-in or where exposures may exceed established exposure levels. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace. **Odor Threshold: 205 - 307 ppm**. The odor threshold only serves as a warning of exposure; not smelling it does not mean you are not being exposed.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

Methylene Chloride (Dichloromethane):

- **OSHA Permissible Exposure Limit (PEL) -**

25 ppm (TWA), 125 ppm (STEL), 12.5 ppm (8-hour TWA - Action Level)

- **ACGIH Threshold Limit Value (TLV) -**

50 ppm (TWA), A2 - suspected human carcinogen.

Protective Equipment

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Neoprene is a recommended material for personal protective equipment. Natural rubber and polyvinyl chloride ARE NOT recommended materials for personal protective equipment.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

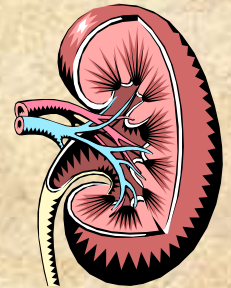
Health Hazard Definitions

- ◆ Carcinogen: Causes cancer
- ◆ Corrosive: Causes visible destruction of living tissue by chemical action
- ◆ Irritant: Causes reversible inflammatory effect on living tissues
- ◆ Sensitizer: Causes most people to develop an allergic reaction after repeated exposure
- ◆ Toxic: Poisonous



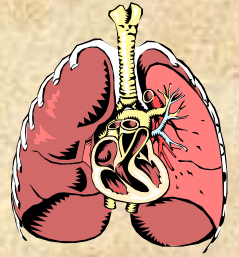
Target Organ Effects

- ◆ Hepatotoxins: Liver damage
- ◆ Neurotoxins: Nervous system damage
- ◆ Nephrotoxins: Kidney damage
- ◆ Hematopoietic: Blood function/
production damage



Target Organ Effects (continued)

◆ Pulmonary Hazard: Damages the lung



◆ Cutaneous Hazard: Affects or damages skin

◆ Ocular hazards: Affects eye or visual capacity



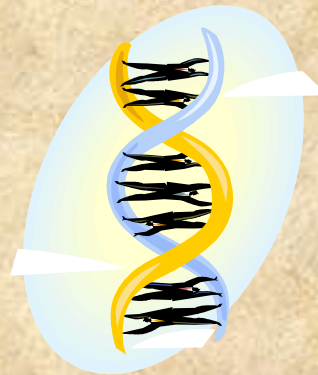
Target Organ Effects (continued)

◆ Reproductive toxins:

Affects reproductive capabilities

- Teratogen: Impacts developing fetus

- Mutagen: Impacts DNA



What Factors Affect Chemical Exposure ?

- ◆ Amount and toxicity of chemical
- ◆ Duration and frequency of exposure
- ◆ Route of entry
- ◆ Hazard controls (Engineering, Administrative and PPE)



Control of Hazards

◆ Engineering Controls

- Substitution
- Isolation
- Ventilation



◆ Administrative Controls

- Standard Operating Procedures (SOP)
- Duration of exposure

◆ Personal Protective Equipment (PPE)

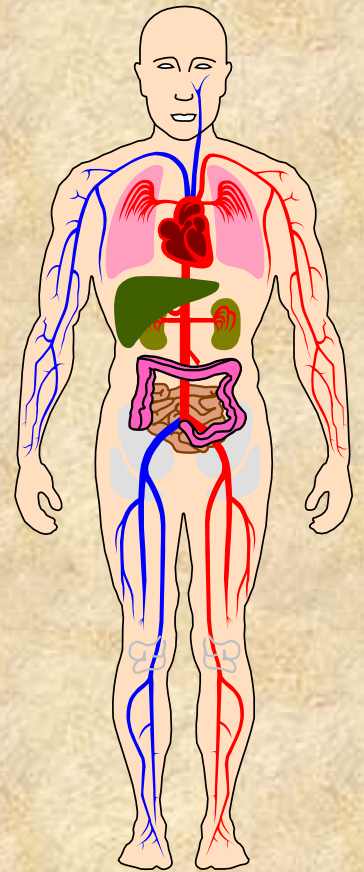
- Gloves, Glasses, Lab coat





How to Detect a Potential Personal Exposure

- ◆ Visual appearance (dust, mist, fume)
- ◆ Odor (odor threshold)
- ◆ Body signs and symptoms
 - (acute vs. chronic effects)
- ◆ Environmental monitoring
 - Permissible Exposure Limit (PEL)





Personal Monitoring

Working Safely with Hazardous Chemicals

- ◆ Read labels
- ◆ Receive chemical specific training
- ◆ Stay alert
- ◆ Wear personal protective equipment
- ◆ See your supervisor for non-routine tasks



Personal Protective Equipment (PPE) Standard





Purpose of the PPE Standard

To provide employees
with appropriate,
reliable and sanitary
PPE that is of safe
design and
construction





What Is Personal Protective Equipment?

Equipment worn to protect workers and students against hazards in the workplace

How Does PPE Work?

By creating a barrier
between the hazard
and your body



Requirements of PPE Standard

- ◆ Conduct hazard assessment
- ◆ Assign and purchase PPE
- ◆ Train employees
 - use, storage, maintenance
- ◆ Document everything
- ◆ PPE covered: Hand, Eye, Foot, Head





Why Is PPE Important?

Every year nearly two million people are injured on the job

One quarter of disabling work injuries affect the eyes, face, head, feet or hands

Most injuries could be prevented with the proper use of Personal Protective Equipment

Who Needs PPE?

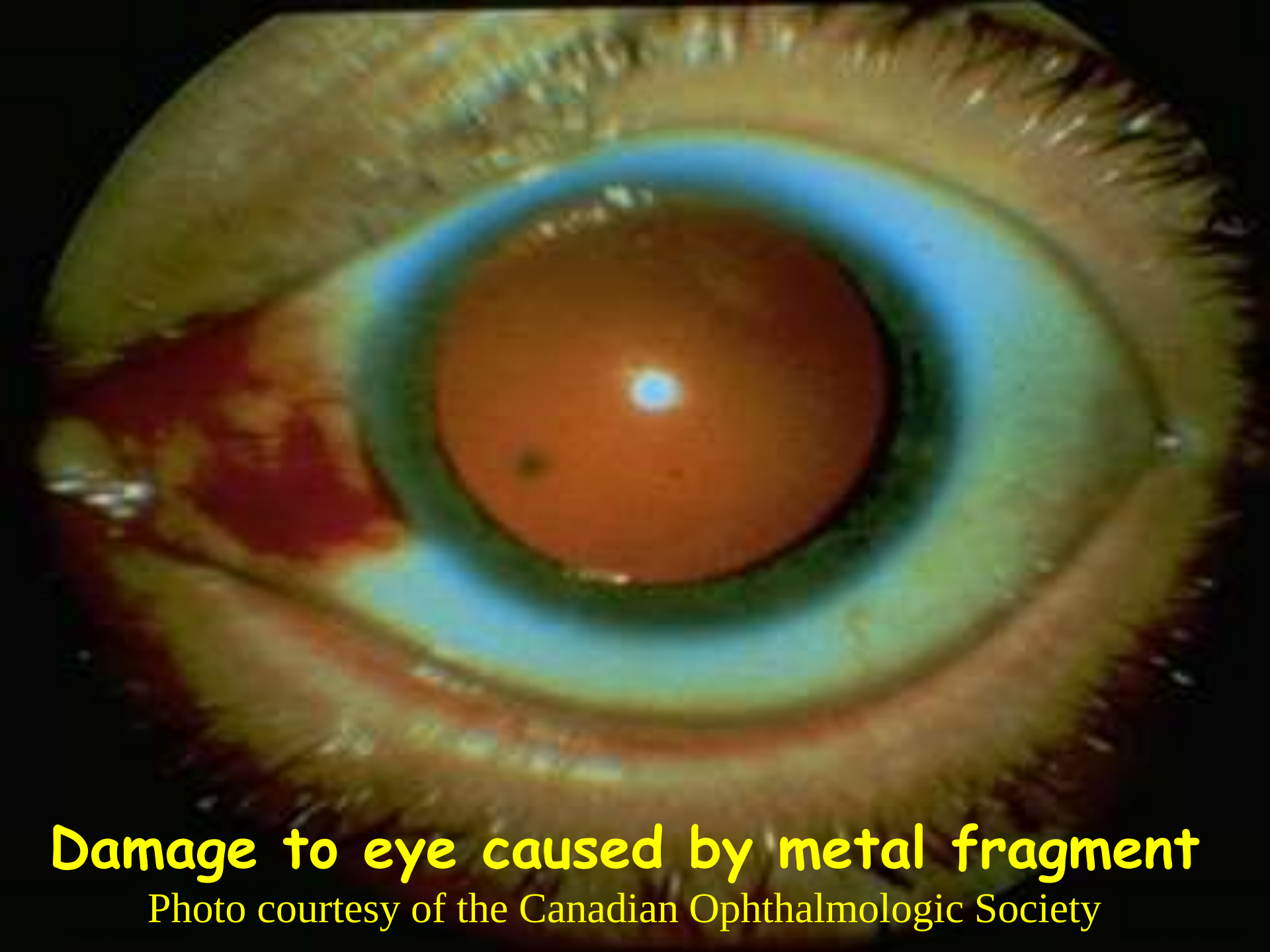
Anyone potentially exposed to chemical, physical, radioactive or biological hazards to the eyes, face, head, feet or hands





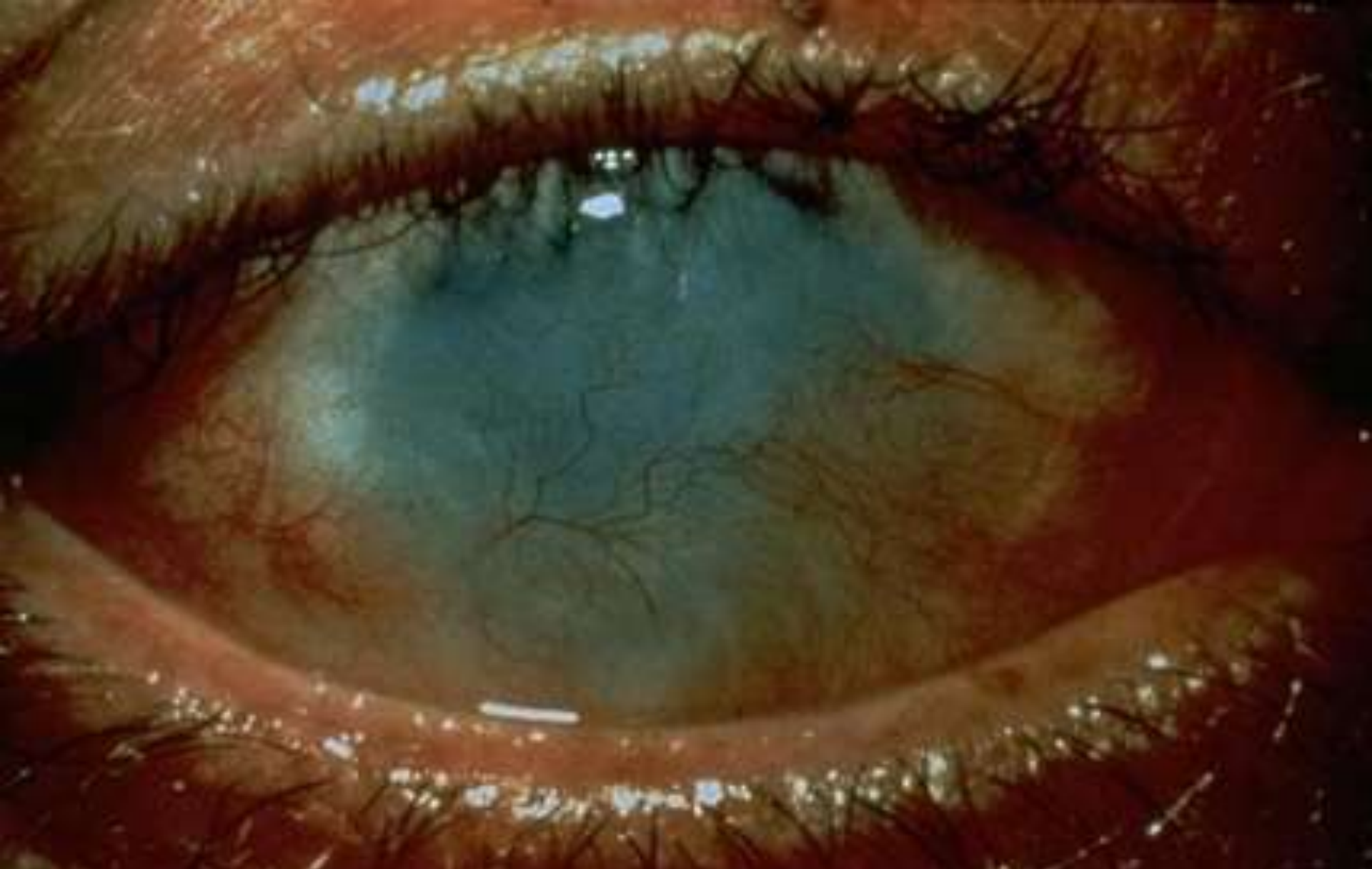
Protective Eyewear





Damage to eye caused by metal fragment

Photo courtesy of the Canadian Ophthalmologic Society



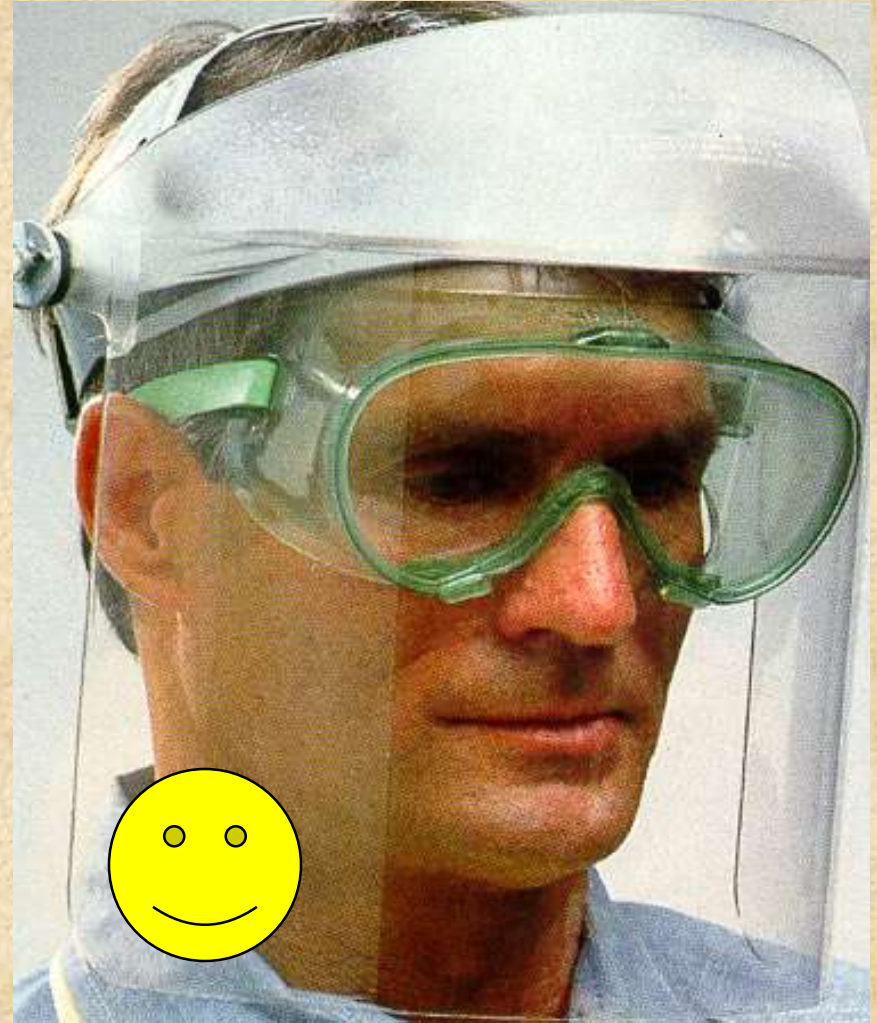
Damage to eye caused by acid

Photo courtesy of the Canadian Ophthalmologic Society

Face Shields



Whose Eyes Are Really Protected?



What Type of Eye/Face Protection Do I Need?

		
Required when: An impact hazard exists or when working with low hazard chemicals*, or when a low probability of splash exists. Examples: • Pipeting • Handling closed bottle of injurious chemical • Mixing solutions • Opening centrifuge tubes	Required when: Working with smaller amounts of corrosive or injurious chemicals* and a reasonable probability of splash exists. Examples: • Pouring acid out of a 1 pint bottle • Pouring methylene chloride from a 1 liter bottle • Working with liquids under pressure	Required when: Working with larger quantities of corrosive chemicals* and / or a high probability of eye and face injury exists. Examples: • Working with an acid bath • Pouring 4 liters of acid into a container • Handling highly reactive chemicals that may spatter

Gloves

- ◆ Ensure proper equipment is available
- ◆ Replace as needed
- ◆ Do not re-use disposable gloves



Laminated Film	Nitrile	Unsupported Neoprene	Supported Polyvinyl Alcohol	Polyvinyl Chloride (Vinyl)	Natural Rubber	Neoprene/ Natural Rubber Blend
						
Barrier	Sol-Vex	29-865	PVA	Snorkel	Canners and Handlers	Chemi-Pro
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Green = glove is very well suited for application with that chemical
Yellow = glove is suitable for application under careful control
Red = Avoid use of glove with this chemical

CHEMICAL:

Acetaldehyde	■	380	E	P	--	--	E	10	F	NR	--	--	NR	--	--	E	7	F	E	10	F
Acetic Acid	■	150	--	G	270	--	E	60	--	NR	--	--	F	180	--	E	110	--	E	260	--
Acetone	▲	>480	E	NR	--	--	E	10	F	P	--	--	NR	--	--	E	10	F	G	10	G
Acetonitrile	▲	>480	E	F	30	F	E	20	G	■	150	G	NR	--	--	E	4	VG	E	10	VG
Acrylic Acid	--	--	--	G	120	--	E	390	--	NR	--	--	NR	--	--	E	80	--	E	65	--
Allyl Alcohol	▲	>480	E	F	140	F	E	140	VG	P	--	--	P	60	G	E	>10	VG	E	20	VG
Ammonium Fluoride 40%	--	--	--	E	>360	--	E	>480	--	NR	--	--	E	>360	--	E	>360	--	E	>360	--
Ammonium Hydroxide	E	30	--	E	>360	--	E	250	--	NR	--	--	E	240	--	E	90	--	E	240	--
Amyl Acetate	▲	>480	E	E	60	G	NR	--	--	G	>360	E	P	--	--	NR	--	--	P	--	--
Amyl Alcohol	--	--	--	E	30	E	E	290	VG	G	180	G	G	12	E	E	25	VG	E	45	VG
Aniline	▲	>480	E	NR	--	--	E	100	P	F	>360	E	F	180	VG	E	25	VG	E	50	G
Aqua Regia	--	--	--	F	>360	--	G	>480	--	NR	--	--	G	120	--	NR	--	--	G	180	--
Benzaldehyde	▲	>480	E	NR	--	--	NR	--	--	G	>360	E	NR	--	--	G	10	VG	G	25	F
Benzene, Benzol	▲	>480	E	P	--	--	NR	--	--	E	>360	E	NR	--	--	NR	--	--	NR	--	--
Bromopropionic Acid	▲	>480	--	F	120	--	E	420	--	NR	--	--	G	180	--	E	190	--	G	180	--
Butyl Acetate	▲	>480	E	F	75	F	NR	--	--	G	>360	E	NR	--	--	NR	--	--	P	--	--
Butyl Alcohol	▲	>480	E	E	>360	E	E	210	VG	F	75	G	G	180	VG	E	20	VG	E	45	VG



Hydrofluoric acid burn

Gloves (continued)

- ◆ Remove gloves BEFORE leaving the work area



- ◆ ALWAYS wash hands after removing gloves



Don't Wear Protective Gloves Outside the Research Laboratory

Gloves may become contaminated during research procedures



Wearing gloves into public areas may lead to cross-contamination



As a routine safety precaution, gloves should be Removed prior to entering any unrestricted area such as corridors, elevators, restrooms, public dining areas, and offices. Please be considerate and protect both the safety and peace of mind of others.

Transporting Specimens



When research samples are transported from one location to another, secondary containers should be used, eliminating the need for gloves.

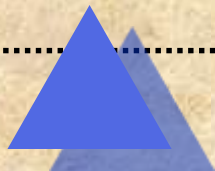


Protective Footwear



**Minimum
PPE
Required In
All Labs**

**No shorts or open
toe shoes allowed
in labs!**



**Safety
Glasses**

Lab coat

**Disposable
Gloves**

What's Wrong?



What's Wrong?





Are There Limitations?

YES!!!

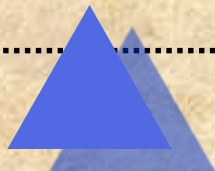
- ◆ PPE cannot protect you if...
 - you do not **wear** it
 - you do not **wear** it properly
 - you do not **wear** the appropriate type for the task you are performing
- 



**INSPECT Your
PPE PRIOR To
Each Use...**



**Do NOT Use
Damaged Or
Defective PPE!!!**



Who Do I Call With Questions?

- ◆ Your Supervisor
- ◆ Your OSEH Representative



Laboratory Safety Standard





Purpose of the Laboratory Safety Standard

To reduce or eliminate the
risk of exposure to
employees from hazardous
chemicals in the
laboratory





CAUTION

CAUTION

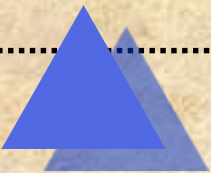


Chemical Hygiene Plan (CHP)

- ◆ Review before working in the laboratory
 - ◆ If unavailable please see your supervisor
 - ◆ Generic CHP is available on-line at:
<http://www.umich.edu/~oseh/chp1.html>
 - ◆ Labs must customize the CHP Notebook section
- 



Laboratory Safety Standard

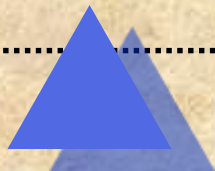
- ◆ *Chemical Hygiene Plan (CHP) Components*
 - Chemical List
 - Standard Operating Procedures
 - Material Safety Data Sheets
 - Emergency Preparedness
- 



Laboratory Safety Standard

CHP Components (continued)

- General and Specific Training
- Specific Waste Disposal Methods
- Personal Protective Equipment
- Inspections and Exposure Monitoring



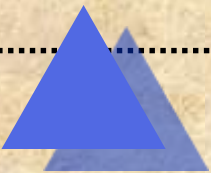
Standard Operating Procedure (SOP)

- ◆ Written for an individual hazardous chemical or method using that chemical and includes:
 - Hazardous properties of chemical
 - Proper chemical storage
 - PPE (gloves, glasses, etc.)





Standard Operating Procedure (SOP) (continued)

- Proper location to perform procedure
 - Proper waste disposal
 - Accident and spill reporting
 - Equipment hazards and precautions
- 

Laboratory Standard Operating Procedure (for the use of hazardous materials or equipment)

Name of Procedure: Working with strong acids in general

Prepared By: John Doe

Revision Date:

LOCATION - This procedure may be performed at the following location(s):

Procedures are performed in Lab 00 in the fume hood. The acids are stored in a corrosive resistant cabinet under the fume hood.

HAZARDS - The following materials and equipment associated with this procedure presents exposure or physical health hazards. Safety precautions are prudent and mandatory:

Eyewash/Safety shower is located down the hall from Lab 00. Dilution of some acids, such as sulfuric acid, produce heat. When diluting, always add acid to water. Never add water to acid. Allow acid to run down the inside of the container and mix slowly by gentle rotation. Acid bottle carriers should be used for containers over one quart in size.

ENGINEERING CONTROLS - Prior to performing this procedure, the following safety equipment must be accessible and ready for use: (ex. chemical fume hood, biological safety cabinet, laminar flow hood, chemical spill kits)

Fume hood is located in Lab 00. The spill kit for neutralizing strong acids is located in the hallway outside of Lab 00.

PROTECTIVE EQUIPMENT - Prior to performing this procedure, the following personal protective equipment must be obtained and ready for use: (ex. acid resistant gloves, safety eyewear, lab coat, chemical splash apron)

Small to Medium Quantities (≤ 1 liter) Acid resistant gloves (Utilize vinyl gloves when working with hydrofluoric acid). Safety goggles (Do not wear contact lenses when working with corrosive materials). Laboratory coat

Large Quantities (> 1 liter) Safety goggles, Face Shield, Utility Gloves, Laboratory coat, and Acid resistant apron

WASTE DISPOSAL - This procedure will result in the following regulated waste which must be disposed of in compliance with environmental regulations:

Prior to filling up a waste container, place a bottle label on with the EPA ID #, start accumulation date, name of chemical, etc. Once full, four one gallon bottles can be placed in a box. Place a box label on the box and fill out a manifest. See the CHP Notebook section on Hazardous Waste to see how to fill out a manifest for the different types of strong acids utilized in Lab 00.

ACCIDENTAL SPILL - In the event that a hazardous material spills during this procedure, be prepared to execute

Compressed Gas Cylinders

- ◆ Always secure in an upright position
- ◆ Use valve protection caps
- ◆ Properly label cylinder
 - Name of gas
 - Type of gas (Oxidizer, Flammable, etc.)
 - Current status "Full or Empty"



Compressed Gas Cylinders (continued)

- ◆ Do not store flammable gasses near ignition sources or oxidizers
- ◆ Do not block access to cylinders
- ◆ Do not run hoses throughout lab



Compressed Gas Rocket



Photo courtesy of AIChE



What's Wrong?



What's Wrong?



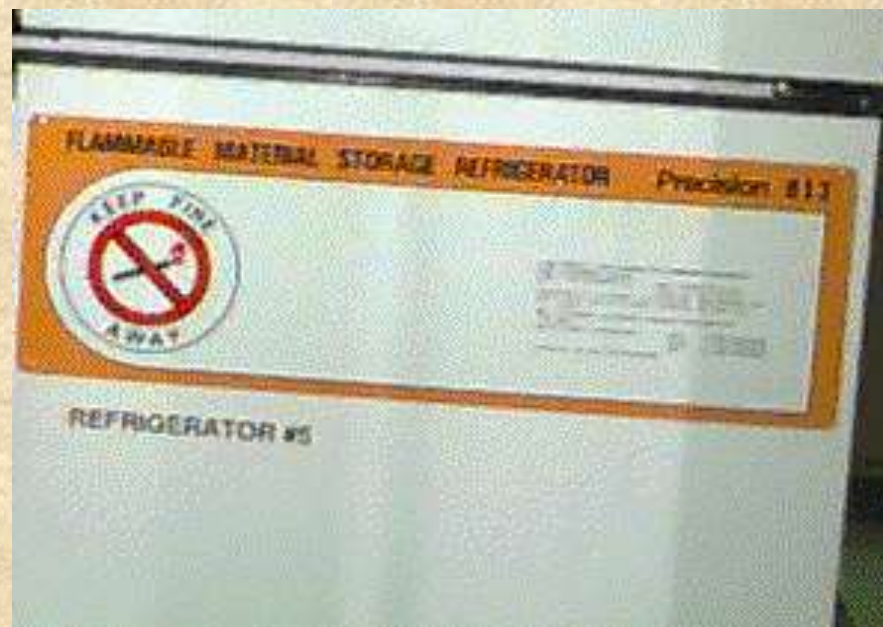
What's Wrong?



Safe Chemical Storage

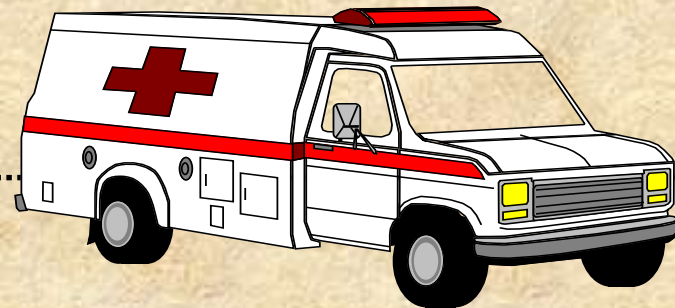


- ◆ Separate stored chemicals by compatibility: (acid, base, flammable, oxidizer)
 - ◆ Store bulk flammable liquids in a Flammable Liquid Storage Cabinet
 - ◆ Refrigerate flammable chemicals only in a unit designed for that purpose
 - ◆ To redistribute unopened chemicals call OSEH HazMat at 3-4568
- 



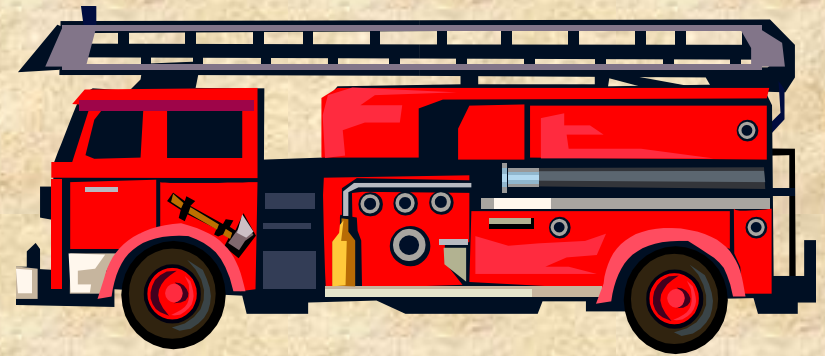
Emergency Preparedness

- ◆ Rule of thumb - Plan ahead!!
It will explode, catch fire, spill, or release
- ◆ Evacuate the lab
- ◆ Shut door & post restriction if necessary
- ◆ Activate alarm & call 911
- ◆ Implement emergency response plan for your unit



Emergency Response

- ◆ Ventilation failures
- ◆ Plumbing leaks
- ◆ Power failures
- ◆ Fires and explosions
- ◆ Spill control and clean-up
- ◆ Personal injury and exposure







What's wrong?



Chemical Waste Disposal: What can go down the sink?

◆ Only...

- Bleach and other disinfectants
- Blood and blood-products
- Detergent and other cleaners
- Buffers, isotonic saline solutions, or non hazardous liquid media, acids/bases with a pH between 5-10





Hazardous Chemical Waste Management

- ◆ Properly store compatible waste
 - ◆ Use secondary containment when > 10 gallons
 - ◆ Pack in a suitable container for transportation
 - ◆ Affix completed "Hazardous Waste" label listing chemicals in the container
 - ◆ Make sure the container is closed and sealed
- 

Hazardous Chemical Waste Labeling



- ◆ EPA ID Number:
 - MI0000052852
- ◆ Manifest Number
- ◆ Generator Information
- ◆ Chemical Description of Hazardous Waste
- ◆ Accumulation Start Date

Call OSEH HazMat (734-763-4568) for assistance



Hazardous Chemical Waste Labeling

- ◆ Label **ALL** hazardous waste containers

DEPT. OF OSEH 1655 Dean Rd. The University of Michigan Ann Arbor, MI 48109-2159 (734) 763-4568	HAZARDOUS WASTE	EPA ID No. MIR 000 001 792
IN CASE OF EMERGENCY CONTACT PUBLIC SAFETY (24 HOURS): (734) 763-1131	WASTE CHEMICALS AND MATERIALS FOR DISPOSAL ONLY	MANIFEST DOCUMENT # 16412
GENERATOR INFORMATION:		
NAME: Joe Generator		
ROOM NUMBER 2264	BUILDING H.H. Dow	
CHEMICAL DESCRIPTION (DO NOT ABBREVIATE) Hexane (70%), ethyl acetate (30%)		MI Act 451/ RCRA Waste Code
HANDLE WITH CARE CONTAINS HAZARDOUS OR TOXIC WASTES AFFIX TO BOTTLE		Accumulation Start Date 03/17/02
Rev. 8/99		

Hazardous Waste Manifest

*See handout for explanation of numbers

UNIVERSITY OF MICHIGAN DEPARTMENT OF OCCUPATIONAL SAFETY AND ENVIRONMENTAL HEALTH 1655 DEAN RD. ANN ARBOR, MICHIGAN 48109-2159 (734) 763-4568															
IN CASE OF EMERGENCY CONTACT PUBLIC SAFETY (24 HOURS): (734) 763-1131					EPA ID No. <u>1</u>					No 16412					
HAZARDOUS WASTE MANIFEST															
NAME <u>2</u>					DEPARTMENT <u>3</u>										
BUILDING <u>4</u>					ROOM <u>5</u>					PHONE <u>6</u>					
ADDITIONAL MANIFESTS NEEDED FOR THIS SHIPMENT ☐ YES ☐ NO <u>7</u>															
Chemical Description (DO NOT ABBREVIATE)						MI Act 451/ RCRA Waste Code	Container		Form			Weight or Volume		Units	
							No.	Type	Solid	Liquid	Gas	Sludge			
<u>8</u>							<u>9</u>	<u>10</u>	<u>11</u>				<u>12</u>		<u>13</u>
1.															
2.															
3.															
4.															
5.															
6.															
Additional descriptions for materials listed above: <u>14</u>						GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by chemical description and are marked, labeled, and are in all respects in proper condition for transport. <u>16</u> <u>17</u> SIGNATURE DATE — FOR OSEH USE ONLY — Transporter 1 Acknowledgment of Receipt of Materials SIGNATURE DATE Transporter 2 Acknowledgment of Receipt of Materials SIGNATURE DATE									
Include Safety precautions and special handling instructions: <u>15</u>															
Discrepancy Indication Space: — FOR OSEH USE ONLY —															
WASTES WILL NOT BE PICKED UP UNLESS ACCOMPANIED BY A COMPLETE MANIFEST WITH SIGNATURE AND DATE															

Tips for Fume Hood Use

- ◆ Check that the hood is operating correctly
- ◆ Use the sash to protect yourself
- ◆ Keep sash at the certification mark



 **OSEH**
Occupational Safety & Environmental Health
753-6973

LABORATORY EXHAUST HOOD
PERFORMANCE CERTIFICATION

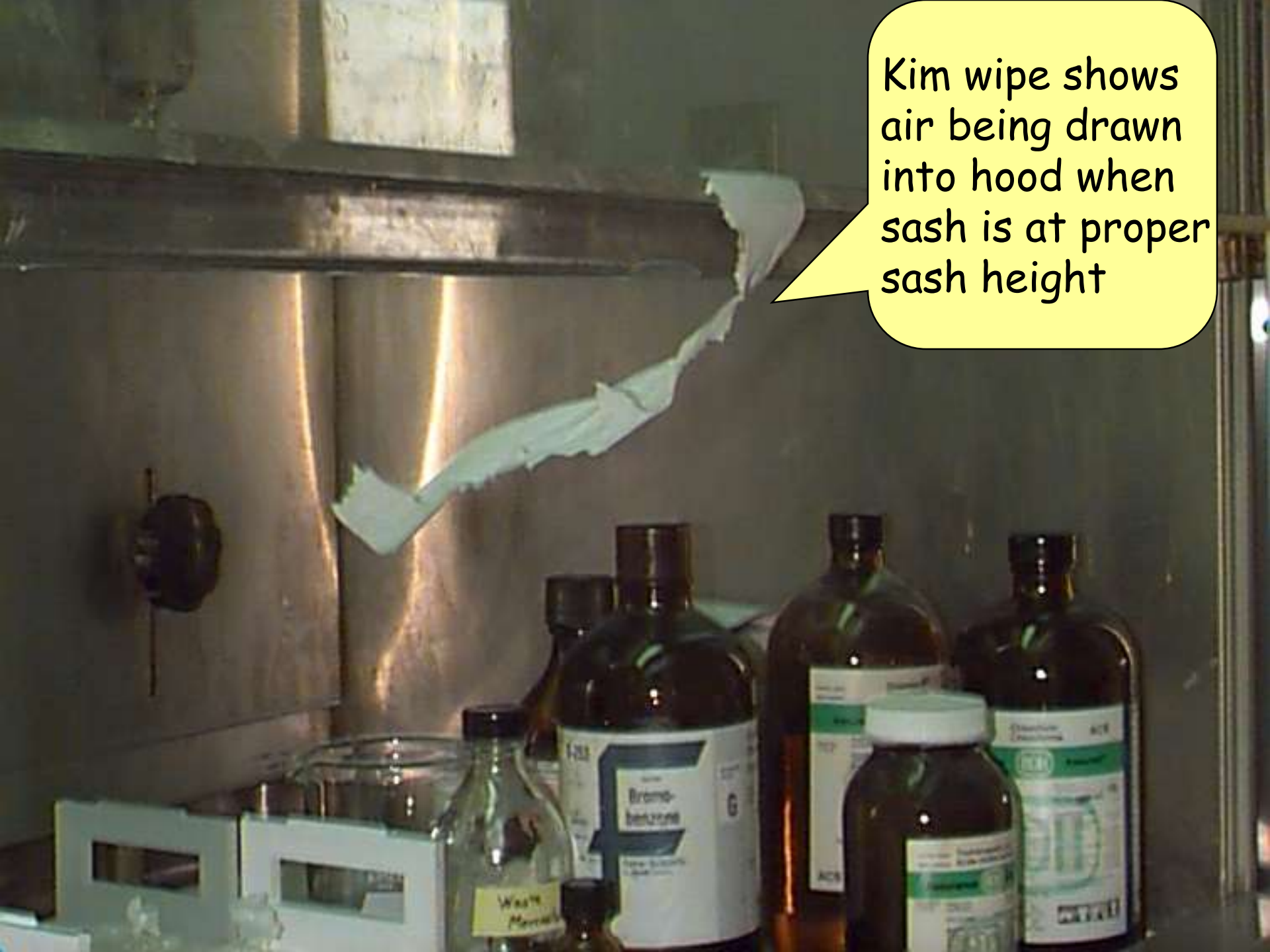
Room 1505 Hood No. 1

Average Face Velocity
of 97 fpm

At a sash height/opening
of 14 in.

ACW 12/3/2001
Surveyor Date

Kim wipe shows
air being drawn
into hood when
sash is at proper
sash height



Tips for Fume Hood Use (continued)

- ◆ Do not use for chemical storage
- ◆ Be aware of ignition sources when using flammables (multiple users of a hood)
- ◆ Keep the work surface neat
- ◆ Close the sash when not in use





What's Wrong?



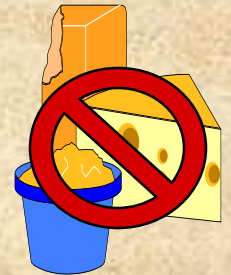
What's wrong with this picture?

No air
movement



Additional Safety Precautions

- ◆ Know location of Emergency Shower and Eyewash (100 feet/10 second rule)
- ◆ Know location of Fire Response Equipment
- ◆ No eating or drinking in laboratories
- ◆ Do NOT store food in laboratory refrigerators; label with appropriate sign
- ◆ Frequent hand washing recommended

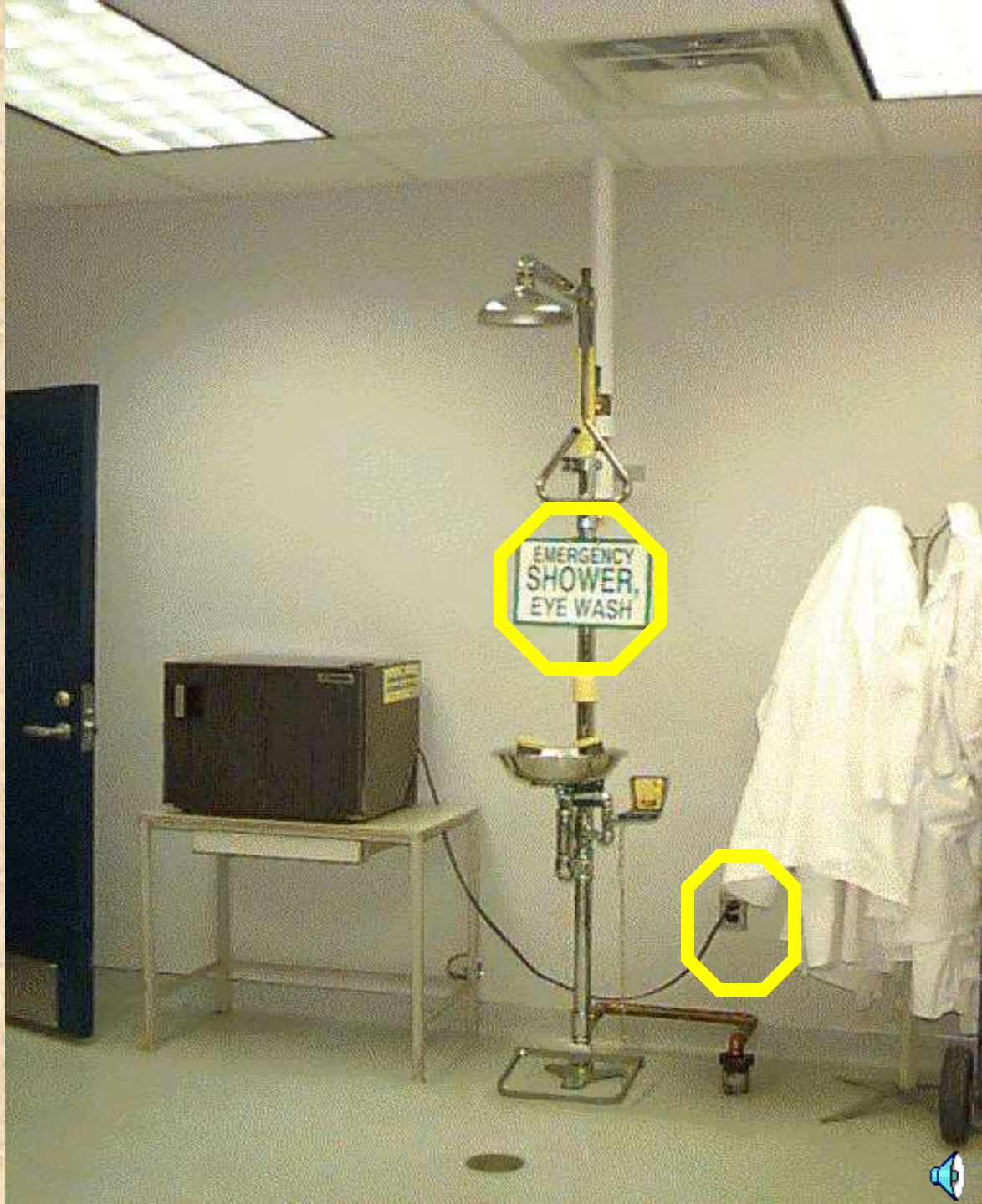


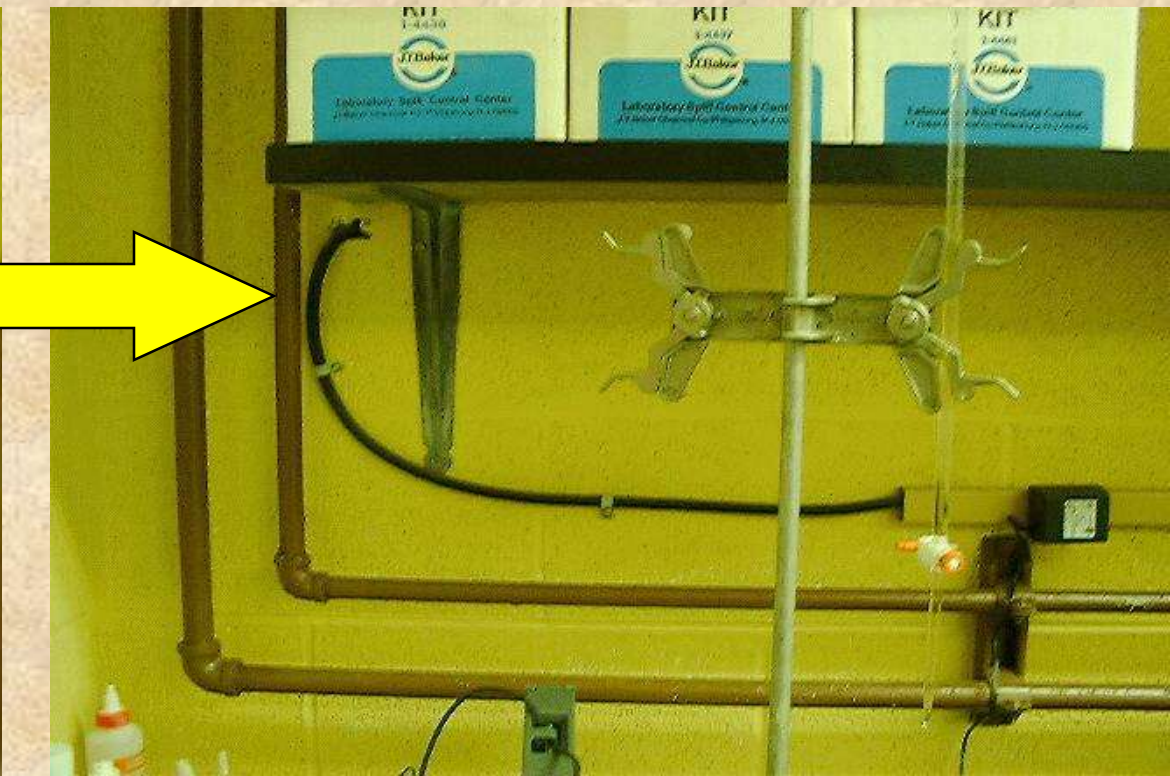
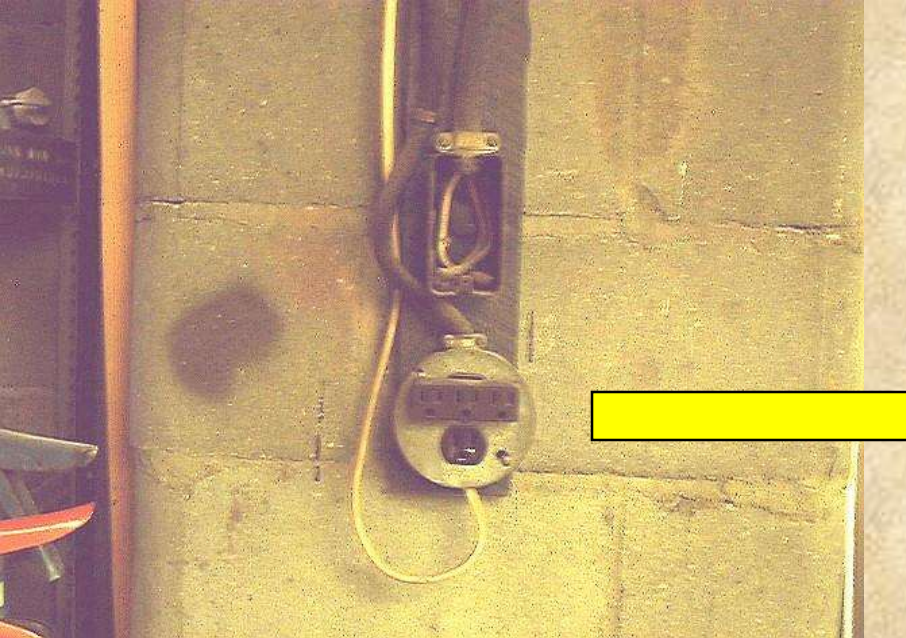


Do Not block
access to
emergency
showers and
eyewash
stations



WASH YOUR HANDS
AND FACE
BEFORE
ENTERING THE
LABORATORY



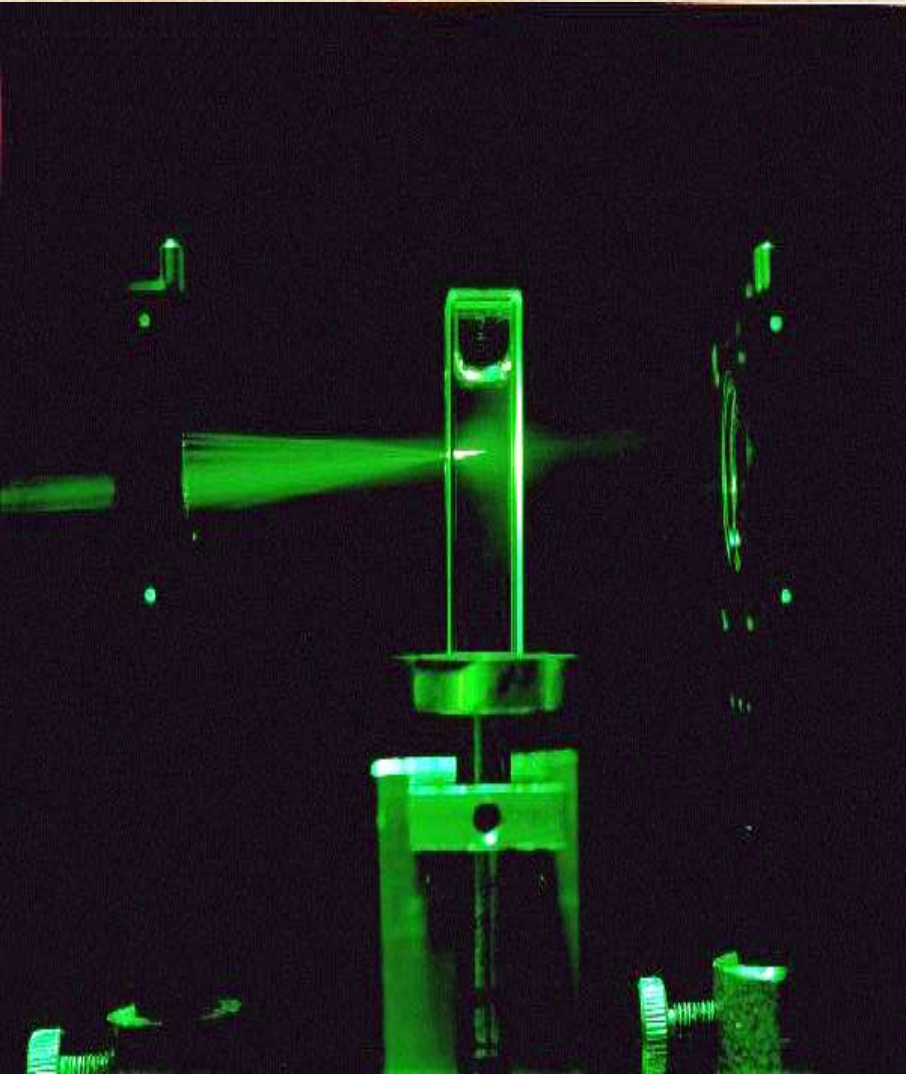






DAYCO
4L380 08676

Buyer's name
100-100-100-100



Class 3B and 4 Lasers require appropriate warning signs and laser in-use notification systems (light/sign)

University of Michigan Occupational Safety & Environmental Health

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December 19, 2002

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[Bioterrorism Act](#)

Welcome to the University of Michigan Department of Occupational Safety & Environmental Health. We've created this web site, the [Pollution Prevention Program](#) web site, and the [OSEH/SNRE Storm Water Education Site](#) to provide the University Community with easy access to information on OSEH's many services and resources.

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