Safety Training

School of Biological Sciences

Fall 2015

Hazard Communication Standard

The Right to Know…And the Right to Understand! We are required by OSHA to ensure that all employees (in our case faculty, staff and students) be familiar and aware of hazards in the workplace

Chemical Hygiene Plan

- Available in all teaching labs and are available in all research labs—check with your PI. **Please read this document!**

Central Location of Safety Information (SDS) and Electronic Database of Chemicals

- Collectively available for the prep room and teaching labs through MSDS Online
- Available in each research lab –check with your PI

System of Chemical Hazard Identification

- We have adopted the Hazardous Materials Identification System (HMIS) and the National Fire Protection Association (NFPA) NFPA 704 system

Standard Operating Procedures—for Lab Processes Involving Hazards

- Available in research labs when applicable—check with your PI

Chemical Hygiene Plan (CHP)

Note: *Direct responsibility for implementation of the CHP belongs to the School Director and the Safety Committee* ***but the responsibility for working safety lies with faculty, students and others doing the work***

EMERGENCY CONTACTS

Campus Emergency	911

School Director
Dr. Susan M. Keenan 970.351.2510
Main Office 970.351.2921

School Chemical Hygiene Officer (CHO)
Dr. Mark Thomas 970.351.2329

Chemical Stockroom
Mr. Frank Skufca, Lab Manager 970.351.2469

Environmental Health and Safety
Mr. Glenn Adams, Director 970.351.1149

Poison Control Center ..... (800)222.1222

Radiation Safety Officer
Dr. Cynthia Galovich 973.351.2079

Campus Police (non-emergency) 970.351.2245

Safety Committee

Chair:
Mark Thomas

Members
Judy Leatherman
Ann Hawkinson
Frank Skufca
Patrick Burns

Chemical Hygiene Plan (CHP)

What type of information is in the CHP?

- General Lab Safety
- Requirements for Instrument Training
- Personal Protective Equipment
- Laboratory Biosafety
- Chemical Classification, Storage and Compatibility
- Safety Data Sheets
- Chemical and Biological Waste
- Decontamination
- Spill Response
- Accident Reporting
- Record Keeping
- Training
- Standard Operating Procedures
- Emergency Response Plan

To use School equipment you need to receive prior training—details in the CHP

Available online:

Biology Forms and Instructions page (at the bottom)

http://www.unco.edu/biology/pdf/Chemical%20Hygiene%20Program%20Biology%20VersionOne%200715.pdf

Safety Data Sheets

SDS

The following 16 sections are now found on safety data sheets:

1. Identification of the chemical and of the supplier
2. **Hazards identification**
3. Composition/information on ingredients
4. First aid measures
5. Firefighting 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
12. Ecological information (non mandatory)
13. Disposal considerations (non mandatory)
14. Transport information (non mandatory)
15. Regulatory information (non mandatory)
16. Other

Material Safety Data Sheets are now simply called Safety Data Sheets and they have a new format

Remember— SDS sheets are located on MSDS Online for all teaching labs and for the prep room. Check with the PI for SDS location in research labs

Safety Data Sheets (Example)

IPS CORPORATION

GHS SAFETY DATA SHEET

WELD-ON® 763™ Low VOC Styrene Rubber Cement

Date Revised: FEB 2010
Supersedes: OCT 2009

SECTION I - PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: WELD-ON® 763™ Low VOC Styrene Rubber Cement
PRODUCT USE: Low VOC Styrene Rubber Cement
SUPPLIER:
MANUFACTURER: IPS Corporation
17109 South Main Street, Carson, CA 90248-3127
P.O. Box 379, Gardena, CA 90247-0379
Tel. 1-310-898-3300

EMERGENCY: Transportation: Tel. 800.424.9300, 703.527.3887 CHEMTREC (International) **Medical:** Tel. 800.451.8346, 760.602.8703 3E Company (International)

SECTION 2 - HAZARDS IDENTIFICATION

GHS CLASSIFICATION:

Health		Environmental		Physical	
Acute Toxicity:	Category 4	Acute Toxicity:	None Known	Flammable Liquid	Category 2
Skin Irritation:	Category 3	Chronic Toxicity:	None Known		
Skin Sensitization:	NO				
Eye:	Category 2B				

GHS LABEL: OR **Signal Word:** Danger **WHMIS CLASSIFICATION:** CLASS B, DIVISION 2

Hazard Statements	Precautionary Statements
H225: Highly flammable liquid and vapor	P210: Keep away from heat/sparks/open flames/hot surfaces – No smoking
H319: Causes serious eye irritation	P261: Avoid breathing dust/fume/gas/mist/vapors/spray
H332: Harmful if inhaled	P280: Wear protective gloves/protective clothing/eye protection/face protection
H335: May cause respiratory irritation	P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
H336: May cause drowsiness or dizziness	P403+P233: Store in a well ventilated place. Keep container tightly closed
EUH019: May form explosive peroxides	P501: Dispose of contents/container in accordance with local regulation

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

	CAS#	EINECS #	REACH Pre-registration Number	CONCENTRATION % by Weight
Methyl Ethyl Ketone (MEK)	78-93-3	201-159-0	05-2116297726-24-0000	54 - 71

All of the constituents of this adhesive product are listed on the TSCA inventory of chemical substances maintained by the US EPA, or are exempt from that listing.
* Indicates this chemical is subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (40CFR372).

SECTION 4 - FIRST AID MEASURES

Contact with eyes: Flush eyes immediately with plenty of water for 15 minutes and seek medical advice immediately.
Skin contact: Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water. If irritation develops, seek medical advice.
Inhalation: Remove to fresh air. If breathing is stopped, give artificial respiration. If breathing is difficult, give oxygen. Seek medical advice.
Ingestion: Rinse mouth with water. Give 1 or 2 glasses of water or milk to dilute. Do not induce vomiting. Seek medical advice immediately.

SECTION 5 - FIREFIGHTING MEASURES

Suitable Extinguishing Media: Dry chemical powder, carbon dioxide gas, foam, Halon, water fog.
Unsuitable Extinguishing Media: Water spray or stream.
Exposure Hazards: Inhalation and dermal contact
Combustion Products: Oxides of carbon, hydrogen chloride and smoke
Protection for Firefighters: Self-contained breathing apparatus or full-face positive pressure airline masks.

	HMIS	NFPA	0-Minimal
Health	2	2	1-Slight
Flammability	3	3	2-Moderate
Reactivity	0	0	3-Serious
			4-Severe

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions: Keep away from heat, sparks and open flame.
Provide sufficient ventilation, use explosion-proof exhaust ventilation equipment or wear suitable respiratory protective equipment.
Prevent contact with skin or eyes (see section 8).
Environmental Precautions: Prevent product or liquids contaminated with product from entering sewers, drains, soil or open water course.
Methods for Cleaning up: Clean up with sand or other inert absorbent material. Transfer to a closable steel vessel.
Materials not to be used for clean up: Aluminum or plastic containers

SECTION 7 - HANDLING AND STORAGE

Handling: Avoid breathing of vapor, avoid contact with eyes, skin and clothing.
Keep away from ignition sources, use only electrically grounded handling equipment and ensure adequate ventilation/fume exhaust hoods.
Do not eat, drink or smoke while handling.
Storage: Store in ventilated room or shade below 44°C (110°F) and away from direct sunlight.
Keep away from ignition sources and incompatible materials: caustics, ammonia, inorganic acids, chlorinated compounds, strong oxidizers and isocyanates.
Follow all precautionary information on container label, product bulletins and solvent cementing literature.

SECTION 8 - PRECAUTIONS TO CONTROL EXPOSURE / PERSONAL PROTECTION

EXPOSURE LIMITS:

Component	ACGIH TLV	ACGIH STEL	OSHA PEL	OSHA STEL:
Methyl Ethyl Ketone (MEK)	200 ppm	300 ppm	200 ppm	

Engineering Controls: Use local exhaust as needed.
Monitoring: Maintain breathing zone airborne concentrations below exposure limits.
Personal Protective Equipment (PPE):
Eye Protection: Avoid contact with eyes, wear splash-proof chemical goggles, face shield, safety glasses (spectacles) with brow guards and side shields, etc. as may be appropriate for the exposure.
Skin Protection: Prevent contact with the skin as much as possible. Butyl rubber gloves should be used for frequent immersion.
Use of solvent-resistant gloves or solvent-resistant barrier cream should provide adequate protection when normal adhesive application practices and procedures are used for making structural bonds.
Respiratory Protection: Prevent inhalation of the solvents. Use in a well-ventilated room. Open doors and/or windows to ensure airflow and air changes. Use local exhaust ventilation to remove airborne contaminants from employee breathing zone and to keep contaminants below levels listed above. With normal use, the Exposure Limit Value will not usually be reached. When limits approached, use respiratory protection equipment.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Milky, medium syrupy liquid
Odor: Ketone
Odor Threshold: 5.4 ppm (MEK)
pH: Not Applicable
Melting/Freezing Point: 86°C (187°F) Based on first melting component: MEK
Boiling Range: 80°C (176°F)
Boiling Point: 80°C (176°F) Based on first boiling component: MEK
Evaporation Rate: > 1.0 (BUAC = 1)
Flash Point: -9°C (16°F) TCC based on MEK
Flammability: Category 2
Specific Gravity: 0.880 @23°C (73°F)
Flammability Limits: LEL: 1.4% based on MEK
UEL: 11.4% based on MEK
Solubility: Solvent portion soluble in water. Resin portion separates out.
Partition Coefficient n-octanol/water: Not Available
Vapor Pressure: 78 mm Hg @ 20°C (68°F) MEK
Auto-ignition Temperature: 515°C (959°F) based on MEK
Vapor Density: >2 (Air = 1)
Decomposition Temperature: Not Applicable
Other Data: Viscosity: Medium bodied
VOC Content: When applied as directed, per SCAQMD Rule 1168, Test Method 316A, VOC content is: ≤ 490 g/l.

SECTION 10 - STABILITY AND REACTIVITY

Stability: Stable
Hazardous decomposition products: None in normal use. When forced to burn, this product gives off oxides of carbon, hydrogen chloride and smoke.
Conditions to avoid: Keep away from heat, sparks, open flame and other ignition sources.
Incompatible Materials: Oxidizers, strong acids and bases, amines, ammonia

SECTION 11 - TOXICOLOGICAL INFORMATION

Likely Routes of Exposure: Inhalation, Eye and Skin Contact
Acute symptoms and effects:
Inhalation: Severe overexposure may result in nausea, dizziness, headache. Can cause drowsiness, irritation of eyes and nasal passages.
Eye Contact: Vapors slightly uncomfortable. Overexposure may result in severe eye injury with corneal or conjunctival inflammation on contact with the liquid.
Skin Contact: Liquid contact may remove natural skin oils resulting in skin irritation. Dermatitis may occur with prolonged contact.
Ingestion: May cause nausea, vomiting, diarrhea and mental sluggishness.
Chronic (long-term) effects: None known to humans

Toxicity:	LD_{50}	LC_{50}
Methyl Ethyl Ketone (MEK)	Oral: 2737 mg/kg (rat), Dermal: 6480 mg/kg (rabbit)	Inhalation 8 hrs. 23,500 mg/m³ (rat)

Reproductive Effects	Teratogenicity	Mutagenicity	Embryotoxicity	Sensitization to Product	Synergistic Products
Not Established	Not Established	Not Established	Not Established	Not Established	Not Established

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicity: None Known
Mobility: In normal use, emission of volatile organic compounds (VOC's) to the air takes place, typically at a rate of ≤ 490 g/l.
Degradability: Biodegradable
Bioaccumulation: Minimal to none.

SECTION 13 - WASTE DISPOSAL CONSIDERATIONS

Follow local and national regulations. Consult disposal expert.

SECTION 14 - TRANSPORT INFORMATION

Proper Shipping Name: Adhesives
Hazard Class: 3
Secondary Risk: None
Identification Number: UN 1133
Packing Group: PG II
Label Required: Class 3 Flammable Liquid
Marine Pollutant: NO

EXCEPTION for Ground Shipping
DOT Limited Quantity: Up to 5L per inner packaging, 30 kg gross weight per package.
Consumer Commodity: Depending on packaging, these quantities may qualify under DOT as "ORM-D".

TDG INFORMATION	
TDG CLASS:	FLAMMABLE LIQUID 3
SHIPPING NAME:	ADHESIVES
UN NUMBER/PACKING GROUP:	UN 1133, PG II

SECTION 15 - REGULATORY INFORMATION

Precautionary Label Information: Highly Flammable, Irritant
Symbols: F, Xi
Risk Phrases: R11: Highly flammable.
R20: Harmful by inhalation.
R36/37: Irritating to eyes and respiratory system.
R66: Repeated exposure may cause skin dryness or cracking
R67: Vapors may cause drowsiness and dizziness
Safety Phrases: S9: Keep container in a well-ventilated place.
S16: Keep away from sources of ignition - No smoking.
S25: Avoid contact with eyes.
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S33: Take precautionary measures against static discharges.
S46: If swallowed, seek medical advise immediately and show this container or label.
Ingredient Listings: USA TSCA, Europe EINECS, Canada DSL, Australia AICS, Korea ECL/TCCL, Japan MITI (ENCS)

SECTION 16 - OTHER INFORMATION

Specification Information:
Department issuing data sheet: IPS, Safety Health & Environmental Affairs
E-mail address: <EHSInfo@ipscorp.com>
Training necessary: Yes, training in practices and procedures contained in product literature.
Reissue date / reason for reissue: 2/23/2010 / Updated GHS Standard Format
Intended Use of Product: Adhesive for bonding/cementing Styrene plastic piping and fittings
All ingredients are compliant with the requirements of the European Directive on RoHS (Restriction of Hazardous Substances).

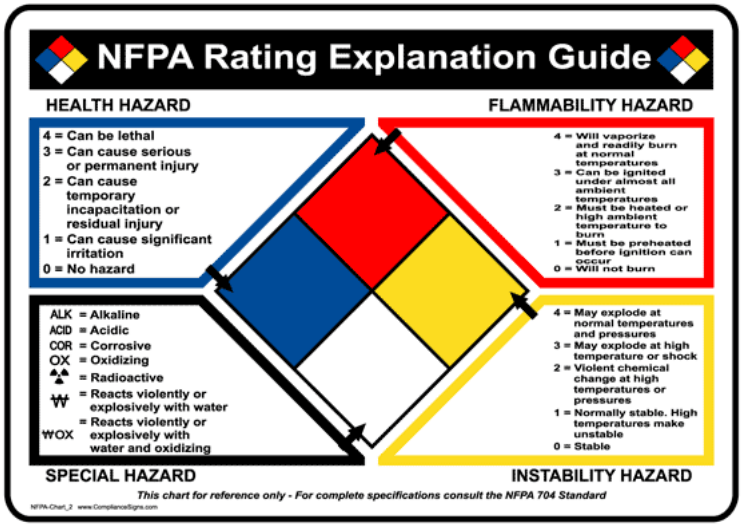
This product is intended for use by skilled individuals at their own risk. The information contained herein is based on data considered accurate based on current state of knowledge and experience. However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof.

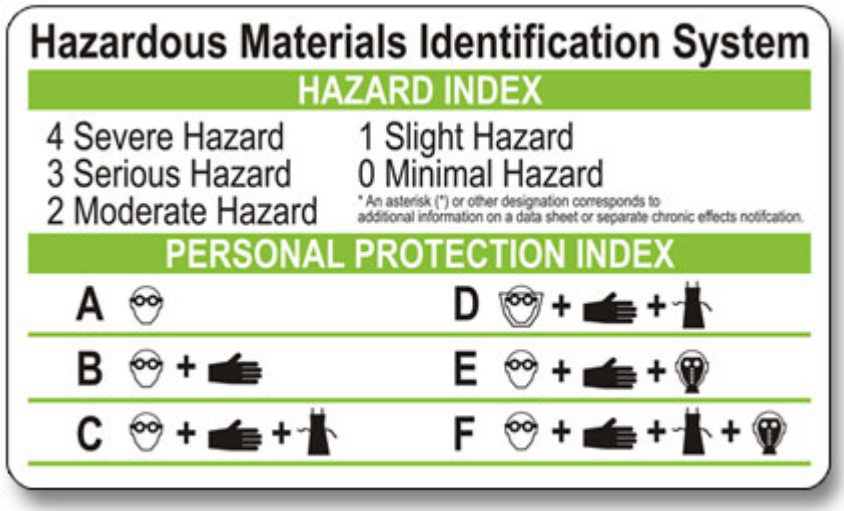
Hazard Identification: HMIS and NFPA

We are using the NFPA rating on the door of labs and the HMIS classification system to label secondary containers.

System of Chemical Hazard Identification

- Chemicals that are in secondary containers (i.e. not the original container from the manufacturer) need to be labeled according to the Hazardous Materials Identification System (HMIS).
  - This system uses **blue** for Health, **red** for Flammability, and **yellow** for chemical reactivity and a rating system for **each category from 0 = minimal to 4 = extreme**.
  - Personal protective equipment (PPE) is specified by a code.
  - For mixtures please consult SDS forms for each component and list the highest hazard rating and all PPE





When is HMIS Secondary Labeling Required?

Secondary labeling is required all containers that will be used longer than a standard working day.

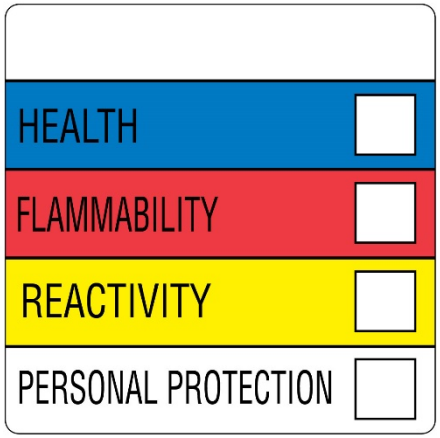
Requirements:

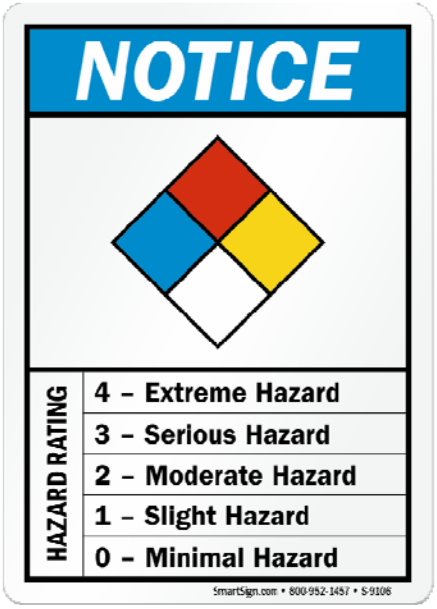
- Name of the chemical in English
- Common names and/or abbreviations
- Concentration of components
- Solvent for solutions
- Date created
- Initials of the creator

Caveats to labeling:

- You can label a rack if all tubes within the rack contain the same solution

- You can use an abbreviation if that abbreviation is posted clearly within the lab environment





Make note of the classification system to determine risk

For Example:

IPS CORPORATION

GHS SAFETY DATA SHEET

WELD-ON® 763™ Low VOC Styrene Rubber Cement

Date Revised: FEB 2010
Supersedes: OCT 2009

SECTION I - PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: WELD-ON® 763™ Low VOC Styrene Rubber Cement

PRODUCT USE: Low VOC Styrene Rubber Cement

SUPPLIER:

MANUFACTURER: IPS Corporation
17109 South Main Street, Carson, CA 90248-3127
P.O. Box 379, Gardena, CA 90247-0379
Tel. 1-310-898-3300

EMERGENCY: Transportation: Tel. 800.424.9300, 703.527.3887 CHEMTREC (International) **Medical:** Tel. 800.451.8346, 760.602.8703 3E Company (International)

SECTION 2 - HAZARDS IDENTIFICATION

GHS CLASSIFICATION:

Health		Environmental		Physical	
Acute Toxicity:	Category 4	Acute Toxicity:	None Known	Flammable Liquid	Category 2
Skin Irritation:	Category 3	Chronic Toxicity:	None Known		
Skin Sensitization:	NO				
Eye:	Category 2B				

GHS LABEL:  OR

Signal Word: Danger

WHMIS CLASSIFICATION: CLASS B, DIVISION 2

Hazard Statements

H225: Highly flammable liquid and vapor
H319: Causes serious eye irritation
H332: Harmful if inhaled
H335: May cause respiratory irritation
H336: May cause drowsiness or dizziness
EUH019: May form explosive peroxides

Precautionary Statements

...ay from heat/sparks/open flames/hot surfaces – No smoking
...reathing dust/fume/gas/mist/vapors/spray
...otective gloves/protective clothing/eye protection/face protection
...INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
...tore in a well ventilated place. Keep container tightly closed
...of contents/container in accordance with local regulation

The use of pictograms suggests the use of GHS

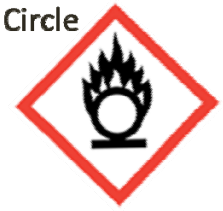
SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

	CAS#	EINECS #	REACH Pre-registration Number	CONCENTRATION % by Weight
Methyl Ethyl Ketone (MEK)	78-93-3	201-159-0	05-2116297728-24-0000	54 - 71

GHS Pictograms

You will see these on shipping containers and some chemicals as well as on newer SDS sheets

Flame Over Circle



- Oxidizers

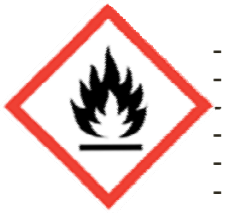
Exploding Bomb

- Explosives
- Self-Reactives
- Organic Peroxides

Gas Cylinder

- Gases Under Pressure

Flame



- Flammables
- Pyrophoric
- Self-Heating
- Flammable Gas
- Self-Reactives
- Organic Peroxides

Corrosive

- Skin Irritation
- Eye Damage
- Corrosive to Metals

Exclamation Mark

- Irritant (skin & eye)
- Skin Sensitizer
- Acute Toxicity
- Narcotic Effects
- Respiratory Tract Irritant
- Hazardous to Ozone

Skull & Crossbones

- Acute Toxicity (fatal or toxic)

Health Hazard

- Carcinogen
- Mutagenicity
- Reproductive Sensitizer
- Target Organ Toxicity
- Aspiration Toxicity

Environmental

- Aquatic Toxicity (Not Required Under HCS)

This Will Typically Be Seen As A DOT Label.

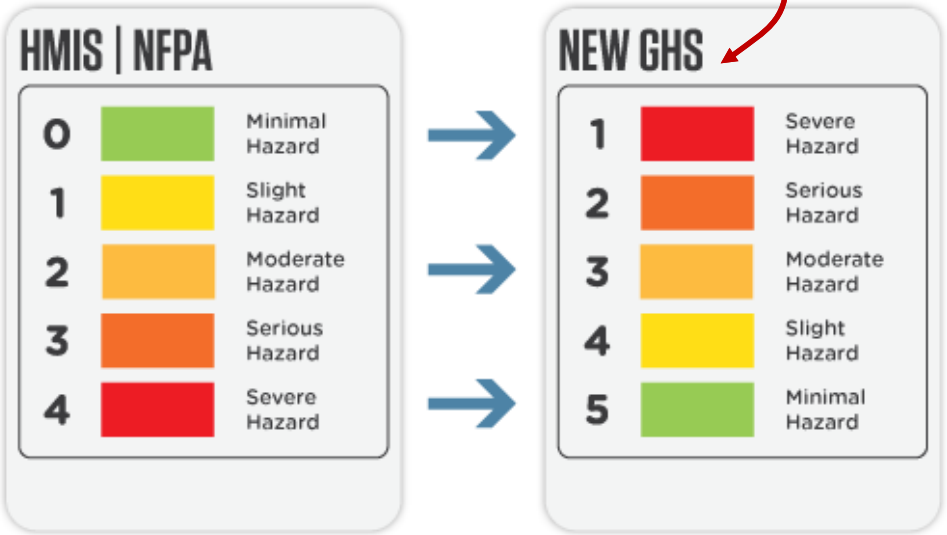
Heard about the GHS system of hazard classification?

Eventually we will be changing systems to GHS—but for now we are required by the Greeley Fire Department to use the NFPA signage on the door to all labs

GHS—Globally Harmonized System

hazard levels are the opposite of the HMIS/NFPA system

Same numbering system inside the labs as on the door!



Note that the HMIS system is in alignment with the NFPA system so we have decided to continue the HMIS system in the labs

First Aid

Know the location of the nearest eye wash and shower to your work area

What to do when exposed to common chemicals:

Consult the SDS for hazard information

If appropriate:

- Eyes: Flush with water for minimum of 15 minutes
- Skin: Flush with water for minimum of 15 minutes
- Inhalation: Move to fresh air
- Ingestion: Get emergency medical assistance

Seek medical attention immediately or after first aid intervention if appropriate

Complete an accident report

Details in the chemical hygiene plan

Chemical Spills

Spill Response

Specific procedures to respond to minor and major spills are outlined in the Chemical Hygiene Plan

Generally:

- Contain the spill if possible
- Call for assistance
  - The Lab PI (contact information in the lab) or the lab instructor
  - Chief Hygiene Officer
    - Dr. Thomas 970 351 2329
  - Lab Manager
    - Frank Skufca 970 351 2469
  - The campus police
    - non emergency 970 351 2245
    - Emergency 911
- ***Secure site and evacuate area as needed***

SPILL RESPONSE

Spill kits are available as outlined below:

Spill Kit Locations	For use in:
1650	1691, 1681, 1671, 1660, 1640
1621	1611, 1631, 1641
1360	1330, 1331, 1380, Herbarium, Museum
2360	2320, 2385, 2335, 2380
2551	2615, 2621, 2640, 2545, 2551
Head house	Greenhouse, 0402

Emergencies

For campus wide emergencies the UNC Police Center will activate the emergency alert system

Specific procedures to respond to different types of emergencies are outlined in the Chemical Hygiene Plan

Severe Weather

- Do not leave the building
- **Move to an interior hallway on the first floor of Ross (the 1500 hallway)**
  - Close the doors at both ends of the hallway and all faculty office doors
- Avoid windows and do not use elevators except to assist people with disabilities
- Crouch down and cover your head

Fire Evacuation

- Never assume that it is a false alarm
- Evacuate quickly and orderly by way of the nearest exit
- **The meeting place for Biology is on the north side of parking lot E (to the north of Ross Hall)**

Please read and become familiar with the Emergency Response Plan as outlined in the Chemical Hygiene Plan

To complete training, you now need to take the quiz associated with this information

***Please remember that until you complete the quiz you are not permitted to work in a faculty research lab or be a teaching assistant (grad or undergrad) in a biology laboratory*.**

You can access the quiz here:

THANK YOU!

Questions or Comments contact:
Dr. Susan Keenan
Susan.Keenan@unco.edu
Fall 2015

UNIVERSITY OF NORTHERN COLORADO