

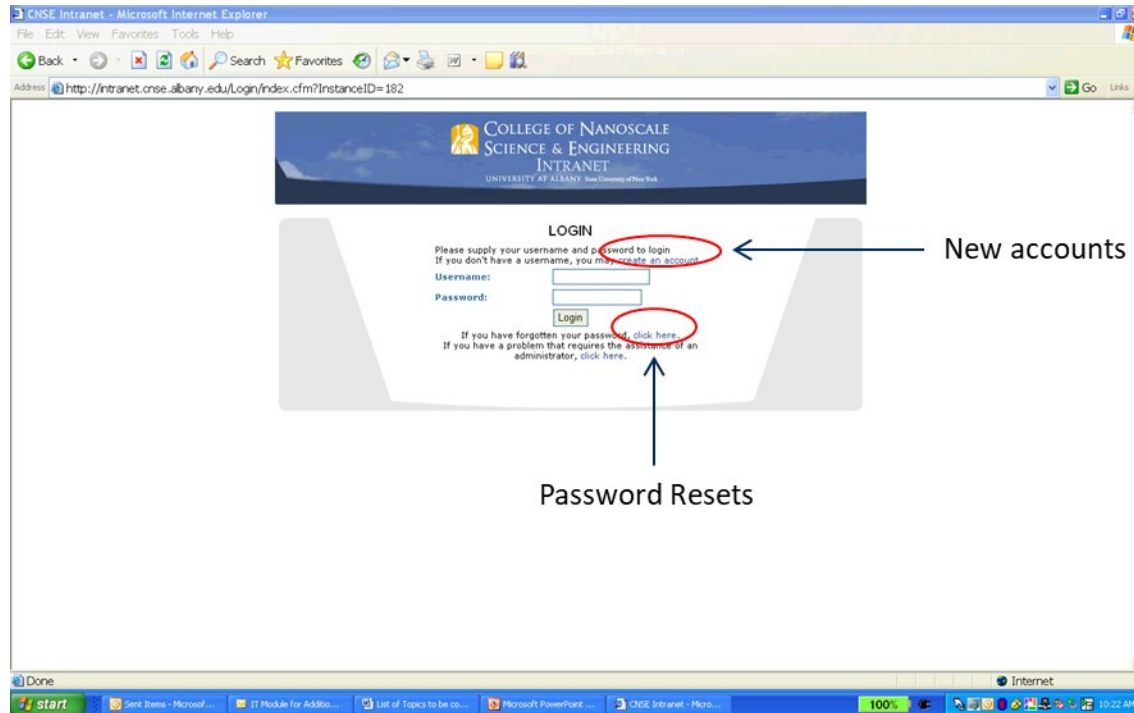
Environmental, Health and Safety (EHS) Orientation Training

AIM Photonics, Test, Assembly,
and Packaging (TAP) Facility
Rochester, NY



NY CREATES/SUNY Poly/EHS Intranet

<http://intranet.sunycnse.com>



Internet

- Go to sunypoly.edu
- On the top right click search
- Search for EHS
- Click on the link for Environmental, Health and Safety
- Select Rochester to access the site specific EHS information such as emergency reporting, evacuation map, procedures + forms, and training



Important Points to Remember

- The SUNY Poly Help Desk is available to assist you with IT related issues.
- The Help Desk can be reached by telephone at **518-956-7272** and by email at cnsehelp@sunypoly.edu
- 24/7 Coverage

Important Points to Remember

- Company owned laptops can be brought into the clean rooms provided their operating system patching and anti-virus software are up-to-date and the device and any removable computer storage media is scanned for viruses on a regular basis.
- All removable media (flash drives, hard drives, CDs) must be scanned at the scanning station outside the gowning room before entering and after exiting the cleanroom.
- Personally owned laptops, phones, iPods, etc. are not allowed to be connected to cleanroom Wi-Fi due to concerns for network security, data confidentiality, and malware infections.



EHS Policy Statement

- NY CREATES is committed to:
 - Protecting the health and safety of its employees, partners, customers and public
 - Protecting the environment
 - Complying with regulatory standards



Employee Responsibilities

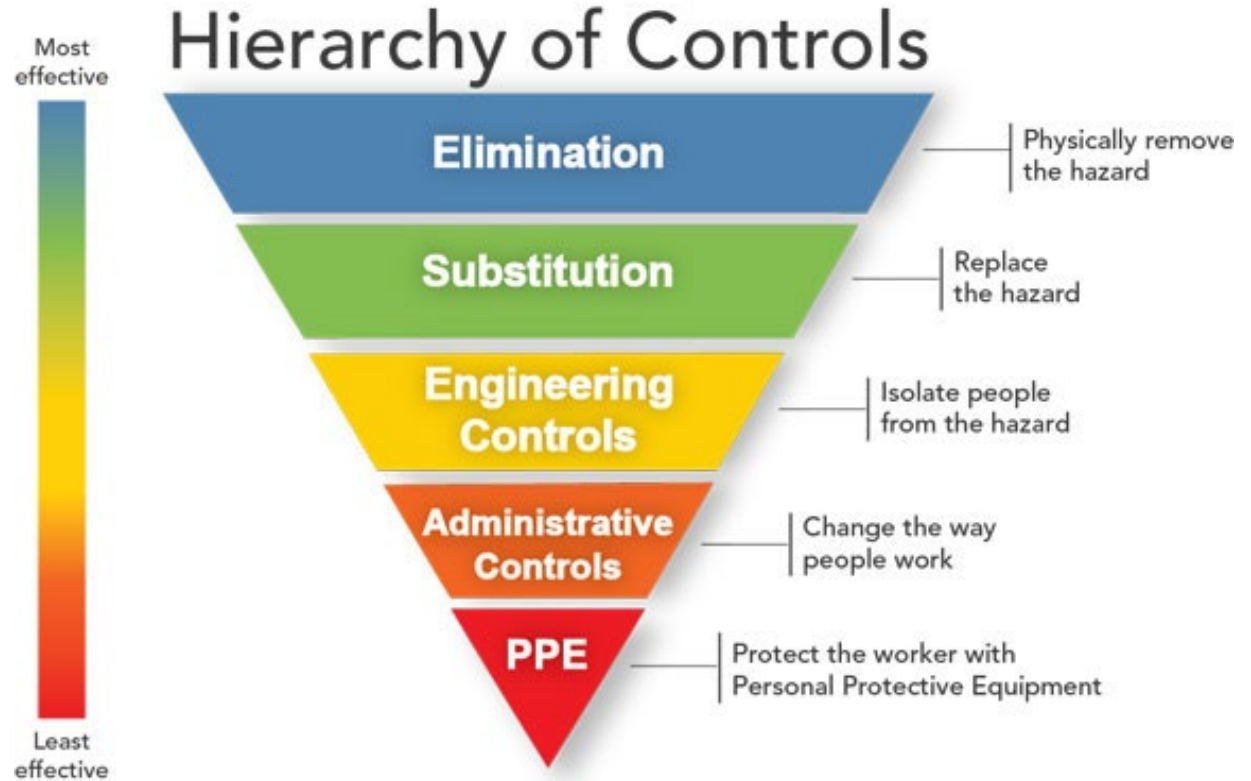
- All individuals are responsible for safety
- Take an active role in your safety and the safety of others
 - Report unsafe behaviors, actions, or conditions
- Understand the potential hazards you may be exposed to
- Plan for and perform tasks in a safe manner
- Follow NY CREATES and your own company's safety policies and procedures
- Contact your manager if you feel you need additional safety training
- Be alert for maintenance concerns and report any concerns (e.g., restrooms, air conditioning, walkways, stairs, doors, lighting, parking lots)
- Take action to correct potential hazards in the workplace by notifying your manager

Prevent Exposure Using the Hierarchy of Controls

- Engineering Controls- methods that are built into the design of a plant, equipment or process to minimize the hazard. Engineering controls are a very reliable way to control worker exposures as long as the controls are designed, used and maintained properly.
- Administrative Controls- are changes in work procedures such as written safety policies, rules, supervision, schedules, and training with the goal of reducing the duration, frequency, and severity of exposure to hazardous chemicals or situations.
- Personal Protective Equipment (PPE)



Prevent Hazard Exposure Using the Hierarchy of Controls





Protect Yourself From Illness

- Follow the Centers for Disease Control and Prevention (CDC) and NYS Department of Health (DOH) guidelines.
- CDC and NYS DOH recommends a flu vaccine every year.
- Wash your hands often with soap and water for at least 20 seconds or use a hand sanitizer that contains at least 60% alcohol
- Avoid touching your eyes, nose or mouth with unwashed hands. Germs spread this way.
- Avoid close contact with people who are sick.



Protect Yourself From Illness

- Stay home if you are sick, except to get medical care.
- Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow. Throw used tissues in the trash.
- Immediately wash your hands.
- Clean and disinfect frequently touched surfaces and objects that may be contaminated with germs.
- Listen to and follow public health advice. This may include information about how to increase distance between people and other measures.

SITE EMERGENCIES AND REPORTING

Working Alone

- A “Buddy” is required when working with highly hazardous materials (e.g., TMAH, pyrophorics) or on high hazard equipment
- Buddies should help each other in case of exposure/emergency
 - e.g., Help victim to emergency shower/eye wash & Call 911 and your Manager.
- Supervisor will determine when a job/task requires a “Buddy”

Site Emergencies

- The following emergencies can occur at this facility:
 - Fire/Smoke
 - Chemical Spill
 - Medical
 - Laboratory/Gas Alarm
 - Utility Failure
 - Violence or Terrorism





Emergency Contact

- **911** for injuries, medical emergencies, fires and chemical spills
- Facilities Manager
585-576-7734
- TAP Manager
585-500-8708
- Kings Landing Control Room
585-327-2047

PRINTING THIS SLIDE IS HIGHLY SUGGESTED



Emergency Reporting

- Call 911 to report any work related injury, accident, illness, fire, medical emergency or chemical spill. Then report it to your manager.
- Managers with EHS assistance will:
 - Investigate work related incidents (e.g., injury, accident)
 - Complete an incident report
 - Take corrective action(s) to prevent recurrence



Fire Emergency Procedures

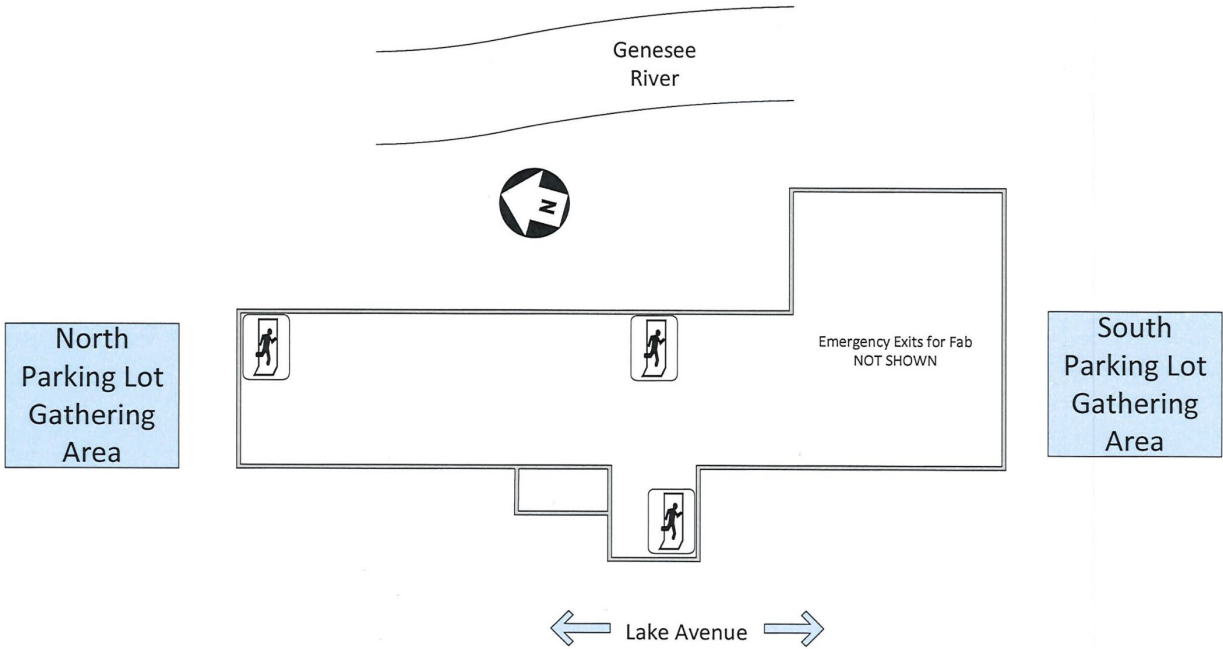
Fire/Smoke

- If you see fire/smoke (and building is not in alarm)
- Leave the fire area, assist others that are in danger area
- Close the door to the room/area where the fire is located
- Activate fire pull station, northeast stairwell and center stairwell and at each exit
- Call 911 and your manager from a safe location
- Continue exiting the building, report to emergency gathering location

If you hear the evacuation horn alarm

- Evacuate via the nearest building exit
- Report to your emergency gathering location
- If able assist others while evacuating
- Do NOT use the elevators

Emergency Gathering Locations



Chemical Exposure

- If you suspect that you have been exposed to a chemical and are experiencing any of the following symptoms:
 - Dizziness
 - Shortness of breath
 - Headache
 - Upset stomach
- CONTACT YOUR SUPERVISOR/MANAGER IMMEDIATELY



Spills

Chemical Spill – Small

- ** Applies only to chemical spills < 1 pint and NFPA rating < 3 in all categories for which you have had training**
- Have needed equipment and PPE
- Collect material and place in hazardous waste bag
- Label debris and put in satellite accumulation area

Chemical Spill – Significant

- **Significant \geq 1 pint or highly (NFPA rating > 3 any category) hazardous material**
- Call **911** and the TAP Manager at **585-500-8708** Determine if anyone needs assistance
- Barricade area & alert others in the area
- Await for emergency services
 - Provide additional information
 - Obtain SDS if you can

For **UNKNOWN** spills, call **911** and TAP Manager at **585-500-8708**.

The OSHA Hazard Communication Standard (HCS) & Globally Harmonized System of Classification and Labeling of Chemicals (GHS)




- Safety Data Sheet (SDS)
- Labels
- Handling and Disposal



Hazard Communication Standard Pictogram

As of June 1, 2015, the Hazard Communication Standard (HCS) will require pictograms on labels to alert users of the chemical hazards to which they may be exposed. Each pictogram consists of a symbol on a white background framed within a red border and represents a distinct hazard(s). The pictogram on the label is determined by the chemical hazard classification.

HCS Pictograms and Hazards

Health Hazard	Flame	Exclamation Mark
		
<ul style="list-style-type: none">• Carcinogen• Mutagenicity• Reproductive Toxicity• Respiratory Sensitizer• Target Organ Toxicity• Aspiration Toxicity	<ul style="list-style-type: none">• Flammables• Pyrophorics• Self-Heating• Emits Flammable Gas• Self-Reactives• Organic Peroxides	<ul style="list-style-type: none">• Irritant (skin and eye)• Skin Sensitizer• Acute Toxicity (harmful)• Narcotic Effects• Respiratory Tract Irritant• Hazardous to Ozone Layer (Non-Mandatory)

Hazard Communication Standard

- Federal Hazard Communication Standard (HCS), Title 29, Part 1910.1200 of the Code of Federal Regulations (OSHA 29 CFR 1910.1200) mandates that
- “Workers have the right to know and understand the hazardous chemicals they use and how to work with them safely.”
- This regulation is designed to make information about hazardous chemicals that are present in work places available to exposed employees.
- The hazard communication standard applies to any business, including manufacturers that use hazardous chemicals, regardless of the number of individuals employed.



Purpose

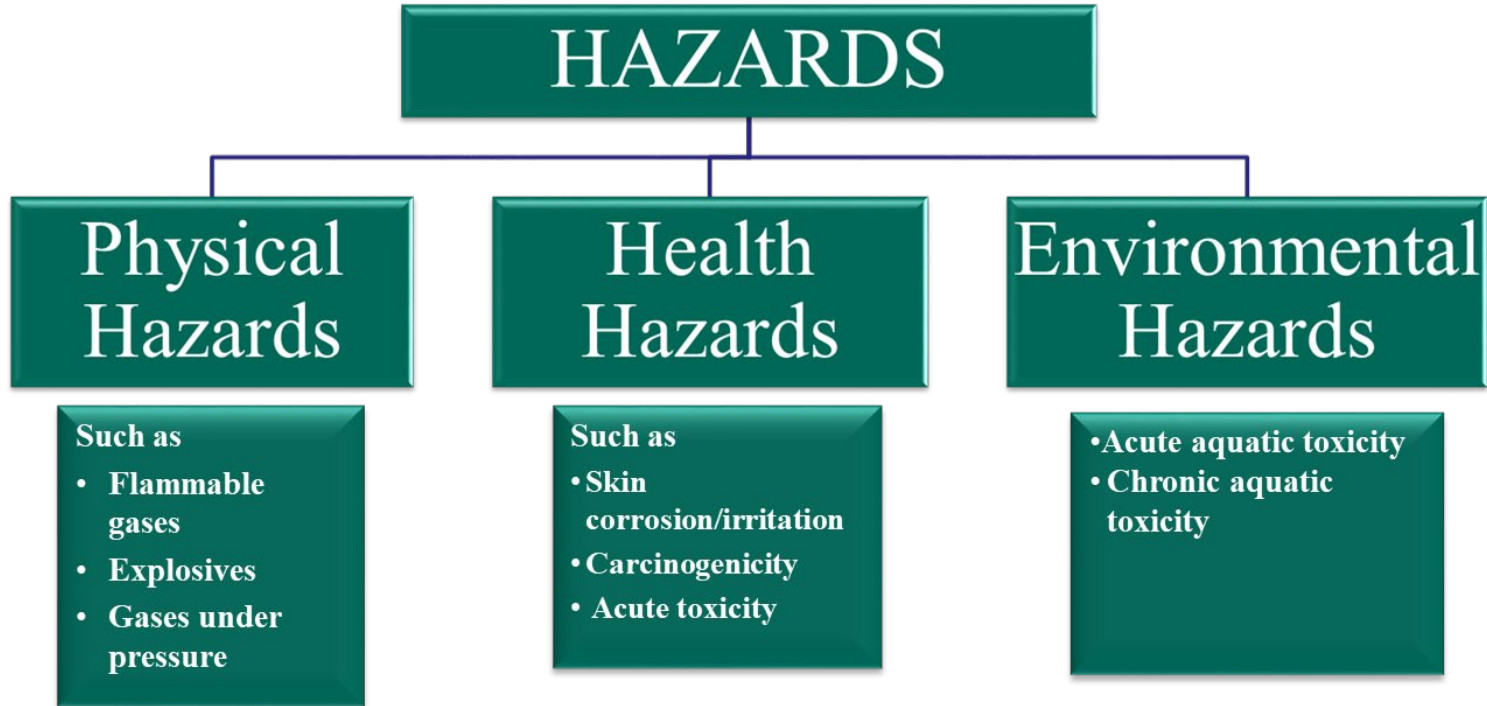
- OSHA Hazard Communication Standard (HCS)
 - Classifies chemicals by their hazards
 - Provides information to employees

Globally Harmonized System (GHS)

- GHS provides a common and coherent way to:
 - Classify the chemicals used in the workplace, and;
 - Communicate the hazard information on labels and safety data sheets with symbols and terms that will be used on both domestic and foreign products and chemicals



Hazard Classification of Chemicals



HCS/GHS Pictograms

- Standardized symbols or graphics
- Used to symbolize health, physical and environmental hazard information
- Will be present on both Safety Data Sheets (SDS) and Labels



GHS Workplace Labeling

- Pictograms – diamonds indicating chemical hazards
- Signal Word- either “Danger” or “Warning” as identified on the chemical SDS. Signal Word is determined by hazard category.
- Hazard Statements- describe the nature and degree of the product risks
- Precautionary Statements- how to handle the product in order to minimize risk

PRODUCT ID:

SIGNAL WORD: DANGER WARNING N/A

HEALTH

FIRE

REACTIVITY

SPECIAL INFO

HAZARD STATEMENT / PRECAUTIONARY INFO

PPE CODE

GHS Labels

- Labels are:
 - Written or printed
 - Graphic information (pictograms)
 - Attached to the immediate container or package of a hazardous chemical
- Labels must be:
 - Legible and clearly displayed
 - In English. (Other languages can be added if needed)
 - Revised within 6 months when new information becomes available

GHS labeling

EPICHLOROHYDRIN 1 **Product Identifier**

UN No. 2023
CAS No. 106-89-8

2 **Signal Word**
DANGER

4 **Hazard Statements**
Flammable. Swallowed. Toxic in contact with skin. Causes severe skin burns and eye damage. May cause an allergic skin reaction. May cause cancer.

5 **Precautionary Statements**
Do not breathe dust. Wear protective gloves/protective clothing/eye protection.

3 **Pictograms**

6 **Supplier Information**
JACKSON CHEMICAL COMPANY - City of Industry, Los Angeles, California, USA (800)-444-456-8989

Fill Weight: 18.52 lbs. Lot Number: A0323111323
Gross Weight: 20 lbs Fill Date: 1/15/2012
Expiration Date: 1/15/2018

GHS Physical Hazard Pictograms				
Flammable	Oxidizers	Corrosives	Explosives	Compressed Gases
<i>Specific physical hazards included in this pictogram group</i>				
-Flammables -Pyrophorics -Self-heating -Emits flammable gas -Self-reactives -Organic peroxides	-Oxidizers	-Corrosive to metals	-Explosives -Self-reactives -Organic peroxides	-Gases under pressure
GHS Health Hazard Pictograms				
Corrosives	Skull & Crossbone	Health Hazard	Exclamation Point	Environmental
<i>Specific health hazards included in this pictogram group</i>				
-Skin corrosion/burns -Serious eye damage	-Acute toxicity (fatal or toxic) (category 1,2,3)	-Carcinogen -Mutagen -Reproductive toxicity -Respiratory sensitizer -Target organ toxicity -Aspiration toxicity	-Irritants (skin and eyes) -Skin sensitizer -Acute toxicity (category 4) -Narcotic effects -Respiratory tract irritant	-Aquatic toxicity (based on LC50 for fish)



Signal Words

- Show the severity of possible hazard and lead people to taking precautions.
 - Warning: used for less severe hazards
 - Danger: used for more severe hazards



Hazard Statement

- Describes nature of hazard(s) of a chemical for each hazard class (i.e., physical, health, environmental)
 - Examples:
 - “Causes serious eye damage through prolonged or repeated exposure.”
 - “Toxic if inhaled”

Precautionary Statement

- Measures to prevent or minimize adverse effects of chemicals during handling, transportation or storage.
 - Examples
 - “Keep away from heat, sparks and open flames and store in a cool, well-ventilated place.”
 - “Do not eat, drink or smoke when using this product.”

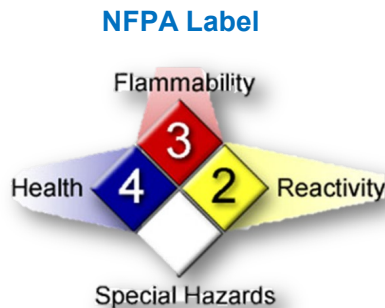
Chemical Labeling

- All chemical containers must be labeled properly!
 - Name of Chemical
 - Primary Hazard(s)
 - Pictograms



Chemical Labels

- Chemicals from suppliers must be labeled
- Do not remove or deface manufacturer's labels
- Secondary containers must be labeled with chemical name and hazard warnings



Globally Harmonized System (GHS) for Hazard Communication Labels

PRODUCT ID:	
SIGNAL WORD	DANGER <input type="checkbox"/> WARNING <input type="checkbox"/> N/A <input type="checkbox"/>
Health	Fire
Reactivity	Special Info
SPECIAL HAZARD / PRECAUTIONARY INFORMATION	
PPE	

Acetone



Danger!

Highly flammable liquid vapor. Causes severe eye irritation.

Keep away from heat, sparks and flame – No smoking. Take precautionary measures against static discharge. Keep from direct sunlight. Keep container closed when not in use. Store in a cool/dry temperature, well-ventilated place away from heat and ignition sources. Use only in a well-ventilated area. Avoid contact with eyes, skin and clothing. Wear appropriate personal protective equipment, avoid direct contact.

IF CONTACT WITH EYES: Flush eyes with water for at least 15 minutes while holding eyelids open.

In case of fire, use water spray, fog or mist. Dry chemicals. Halon. Powder, foam or CO₂.

See Safety Data Sheet for further details regarding safe use of this product.

ABC Company, Main Street, Anytown, NJ 00000, Tel: 555 123 4567

Labels: NFPA Diamonds

Flammability –

Flash Points:

4 – Below 73 °F

3 – Below 100°F

2 – Between 100°F and 200°F

1 – Above 200°F

0 – Will not burn

Health Hazard

4 – Deadly

3 – Serious or Permanent injury

2 – Temp. Incapacitation

1 – Significant irritation

0 – No Hazard



Special Hazards: OX – oxidizer

W – reacts violently w/water

ACID – Acid

COR – Corrosive

ALK – Alkali

SA – Simple Asphyxiants

CHEMICAL/GAS NAME	Chem Formula	HEALTH	FLAMMABILITY	REACTIVITY	SPECIAL
Process Chamber					
Silane (100%)	SiH ₄	0	4	3	
Disilane (100%)	Si ₂ H ₆	1	4	2	
Nitrous Oxide (100%)	N ₂ O	1	0	0	
Nitrogen Trifluoride (100%)	NF ₃	2	0	0	
Phosphine (.4% / balance Nitrogen)	.4 % PH ₃ / N ₂	4	4	1	
Diborane (.1 % / balance Hydrogen)	.1% B ₂ H ₆ / H ₂	4	4	1	

Instability:

4 – May self detonate

3 – Shock and heat may detonate

2 – Violent chemical change

1 – Unstable if heated

0 – Stable

Types of Chemicals

- Flammables and Pyrophorics
- Carcinogens
- Toxics
- Corrosives
- Oxidizers
- Compressed Gases
- Cryogenics



Physical and Chemical Hazards

- Flammable
- Pyrophoric
- Peroxide-formers
- Oxidizers
- Irritants
- Sensitizers
- Corrosives (acids, bases)
- Toxics (poison)
- Asphyxiants
- Carcinogens, Teratogens, Mutagens



Safety Data Sheets (SDS)



SAFETY DATA SHEET

SDS ID NO.: 0127MAR019
Revision Date 06/01/2016

1. IDENTIFICATION

Product Name: Marathon Petroleum Gasoline - All Grades

Synonym: Gasoline; Regular Unleaded Gasoline; Conventional Regular Unleaded Gasoline; Mid Grade Unleaded Gasoline; Conventional Mid Grade Unleaded Gasoline; Premium Unleaded Gasoline; Conventional Premium Unleaded Gasoline; Sub-Octane Gasoline; Regular RBOB; Super RBOB; Premium RBOB; RBOB; Reformulated Blend Stock For Oxygenated Blending; 84 Octane Gasoline; CBOB; Premium CBOB; Conventional Blend Stock for Oxygenate Blending; Recreational Gasoline; Recreational Gasoline; Recreational Unleaded Gasoline; 89 Recreational Gasoline; Brand 89 Recreational Gasoline; 7.0 Max RVP 89 Recreational Gasoline; BR 7.0 Max RVP 89 Recreational Gasoline; 90 Recreational Gasoline; 90 Marina Gasoline; Brand 91 Recreational Gasoline; 91 Recreational Gasoline; 91 Marina Gasoline; 90 Octane Midgrade Gasoline with No Ethanol; 0125MAR019; 0126MAR019; 0134MAR019; 0313MAR019; 0314MAR019 0127MAR019

Product Code:

Chemical Family: Complex Hydrocarbon Substance

Recommended Use: Fuel.

Restrictions on Use: All others.

Manufacturer, Importer, or Responsible Party Name and Address:
MARATHON PETROLEUM COMPANY LP
539 South Main Street
Findlay, OH 45840

SDS information: 1-419-421-3070

Emergency Telephone: 1-877-627-5463

2. HAZARD IDENTIFICATION

Classification

OSHA Regulatory Status

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

Flammable liquids	Category 1
Skin corrosion/irritation	Category 2
Germ cell mutagenicity	Category 1B
Carcinogenicity	Category 1B
Reproductive toxicity	Category 2
Specific target organ toxicity (single exposure)	Category 3
Aspiration toxicity	Category 1
Acute aquatic toxicity	Category 2
Chronic aquatic toxicity	Category 2

- Source of information on hazards of chemicals
- SDSs (formerly MSDS) are available 24/7 using the HAZMIN database on the EHS intranet page (Approved Chemical List).
- EHS approves all chemical purchases on a lab by lab or tool by tool basis.
- All Chemicals must have an SDS on file

Safety Data Sheets

- Provides information on the chemical including:
 - Physical/chemical properties (pH, flash point, etc.)
 - Toxicity data
 - Storage and shipping requirements, incompatibles
 - Required PPE
 - Emergency response procedures
 - NFPA codes
- Are available 24/7 through Hazmin
- SDSs are also searchable on the internet – manufacturer websites

Safety Data Sheet (SDS)

- Uniform format and sections
- 16 sections (12 mandatory);
 - Identification
 - Hazard(s) identification
 - Composition/information on ingredients
 - First-Aid measures
 - Fire-fighting measures
 - Accidental release measures
 - Handling and storage
 - Exposure controls/personal protection
 - Physical and chemical properties
 - Stability and reactivity
 - Toxicological information
 - Ecological information
 - Disposal considerations
 - Transport information
 - Regulatory information
 - Other information

} Non mandatory



How Can You be Exposed?

- Ingestion: Eating
- Inhalation: Breathing in through the mouth or nose
- Injection: Needle stick or into a cut, directly into bloodstream
- Absorption: Contact with the skin or eye

We have engineering controls, administrative controls and PPE to protect you in the presence of potential hazards.



Chemical Odors in the Cleanroom

- People can smell certain chemicals at low levels before they reach an occupational exposure limit (e.g., solvents)
- Conversely, some chemicals can be at dangerous concentrations with no odor at all (e.g., CO)
- If you feel any symptoms you believe are work-related, remove yourself to fresh air and notify your Supervisor/Manager.

Pouring Chemicals Guidelines

- Know the hazard before using a chemical (review SDS)
- Use appropriate PPE; barricade the area
 - Gloves, goggles, coat apron, face shield
- Pour chemical in a fume hood or with local exhaust ventilation
- If pouring larger quantities (>5L); use peristaltic or hand pump
- If mixing solutions- ensure that the chemicals are compatible and establish mixing protocols/procedures
- Don't eat or drink when handling chemicals – always wash your hands afterwards

Chemical Splash

- If you get any chemical on you
 - Immediately go to the shower/eyewash & activate
 - Remove contaminated clothing: Clothing will keep the chemical in close contact with the skin
 - Rinse for 15 minutes with water or until medical help arrives
 - Get someone to call 911 if needed and notify your supervisor
 - Contact to the eyes: Hold eyelids open and apart with your thumbs and finger while rinsing



Did You Know:

Showers/ eyewashes should be within a 10 second walk!!

Flammable



- Based on its flashpoint
- The lower the flashpoint, the easier it is to ignite the material
- Keep away from heat, ignition sources, and strong oxidizers
- Flammable storage cabinets must be self-closing, grounded, and labeled:
 - “FLAMMABLE – KEEP FIRE AWAY”
- Storage of flammables in refrigerators must utilize explosion proof refrigerators certified by the manufacturer.
- They must also be labeled:
 - NOTICE
 - FOR CHEMICAL STORAGE ONLY
 - DO NOT STORE FOOD OR BEVERAGES IN THIS REFRIGERATOR

Corrosives



- Determined by pH and concentration (see SDS)
- Corrosives are destructive to human tissue.
- Severity of damage depends on concentration of corrosive
- Severe exposure may cause permanent damage
- Wear gloves, eye and face protection when handling corrosives
- FIRST AID – Flush a minimum of 15 minutes
- Acids and bases MUST be segregated for storage. Use plastic trays, tubs or buckets for separation within the cabinet

HF



Substance	pH
Battery acid	0.5
Gastric acid	1.5 – 2.0
Lemon juice	2.4
Cola	2.5
Vinegar	2.9
Orange or apple juice	3.5
Beer	4.5
Acid Rain	<5.0
Coffee	5.0
Tea or healthy skin	5.5
Milk	6.5
Pure water	7.0
Healthy human saliva	6.5 – 7.4
Blood	7.34 – 7.45
Sea water	8.0
Hand soap	9.0 – 10.0
Household ammonia	11.5
Bleach	12.5
Household lye	13.5

TMAH



Oxidizers



- Substances that initiate or promote combustion in other materials
 - Hydrogen peroxide
 - Oxygen
 - Concentrated nitric acid (>69%)

CAUTION
Avoid storage
next to
flammables!

Irritants



- Produce inflammation of tissue upon contact
 - On your skin
 - If you inhale an irritating chemical vapor, gas, or mist
- Short term exposure to an irritant is generally reversible once the irritant is removed



Sensitizers



- Cause allergic reactions (sensitization)
 - Dose related
 - Can cause you to develop an allergic response which could be immediate or delayed (several weeks or months depending on individual)
 - Can be severe or fatal
 - Examples:
 - Latex gloves
 - Formaldehyde
 - Diesel Fuel



Toxics

- Able to cause illness/disease, injury, death



- Includes:

- Carcinogens
- Mutagens
- Organ Toxicity
- Reproductive Toxins
- Teratogens
- Sensitizers

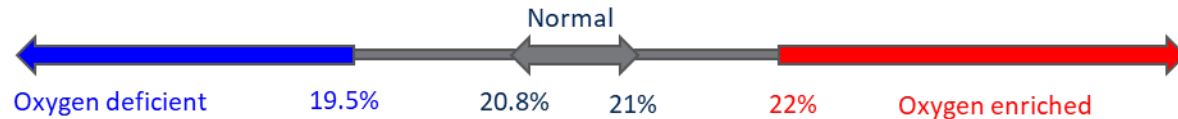


- Everything can be toxic!
 - The dose makes the poison



Asphyxiants

- Simple Asphyxiants - Displaces oxygen (e.g., Nitrogen)
- Chemical Asphyxiants - Interfere with Oxygen delivery
 - Can have other hazards (flammable)
 - Can also be odorless (e.g., carbon monoxide (CO))



Carcinogens



- Agents that produce or accelerate the development of malignant tumors
 - Can remain dormant for up to 40 years
- Contributory factors include:
 - Lifestyle - diet, smoking and alcohol (80-90%)
 - Chemical exposure level
 - Genetics
 - Age
 - Sex
 - Hormone levels
 - Immunologic (AIDS)

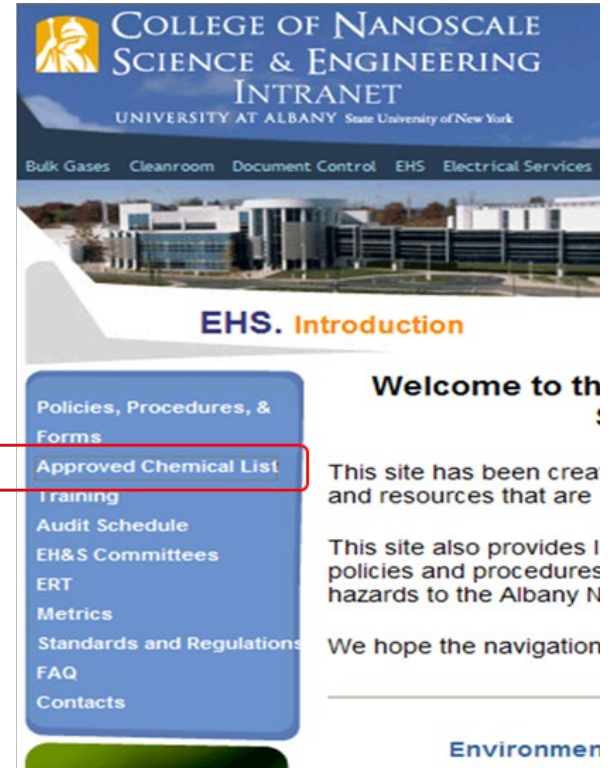
Tetra Methyl Ammonia Hydroxide (TMAH)



- Causes injury or death from skin contact at or above 1% TMAH in water
- TMAH is corrosive to the skin, eye, and upper respiratory tract
- TMAH can be highly toxic and fast-acting
- FIRST AID - Get in a safety shower ASAP!
- Signs and symptoms of exposure:
 - 2nd to 3rd degree burns of skin
 - Irregular breathing and heart beat
 - Progressing to coma, shock and/or death
- Follow the SDS, procedures, hazard assessment; use appropriate controls and PPE to prevent exposures

Obtaining Chemicals

- Approved Chemical List
 - On EHS Intranet Site
 - Use the Hazmin Database
- Chemical Approval Process
 - All chemicals must be approved by EHS before purchase
 - Approvals are specific to that location/tool
 - Complete online form (through Hazmin Database)
 - Provide SDS, volume, location, etc.
 - If your chemical requires a tool modification, you will need to go through equipment commissioning procedure



If you are pregnant or intend to start/continue a family

- Be especially careful to avoid contact with chemicals, particularly those that are reproductive toxins or teratogenic
- If you are concerned, consult your physician and supervisor
- Some reproductive toxins can have adverse affects on males



Transporting Hazardous Production Materials (HPMs)

- Liquid HPM transport requires secondary containment when outside their DOT shipping container
- Incompatible chemicals cannot be transported together on the same cart
- Only specific transport routes can be used for HPMs
- Passenger elevators should never be used to transport HPMs
- No one is to ride in an elevator with HPM chemicals.
- Two qualified persons are required for transporting HPM chemicals in freight elevators (one to send the chemicals and one to receive the chemicals).
- Do not transport any chemicals in personal vehicles

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Eye and Face Protection



- Safety Glasses
 - Safety glasses with side shields are required to be worn in posted areas and to protect the eyes from flying fragments, objects, chips, particles, etc.
- Goggles
 - Goggles are required to be worn to protect the eyes from chemical (e.g., acid, caustic) splash and spray hazards, chemical gases or vapors, irritating mists, dust hazards, etc.
- Face Shields
 - Face shields provide face protection for severe exposure (e.g., chemicals, flying objects). Face shields must be worn over primary eye protection (i.e., safety glasses with side shields or goggles) providing a higher level of protection to the face and eyes

If you get a chemical in your eye or on your skin, start rinsing immediately with water

Foot Protection



- Safety Shoes and Boots
- Rubber or Chemical
- Required when working in areas and/or performing tasks where there is a danger of foot injuries due to handling or carrying heavy materials, falling or rolling objects, or other foot hazards in the workplace.

While working in Cleanroom and Lab areas shoes must have

- Closed heels and toes
- Heel height <2"
- Heel base at least 1/2"
- Soles must be non-porous and impervious
- NO open toed shoes

Hand & Body Protection

- Many different materials and styles.
- Gloves / Sleeves
 - Sharp objects/Cut resistant: Leather, Kevlar
 - Chemical Resistant - Tri-polymer blend of nitrile, neoprene and natural rubber– used for MOST (not ALL) acids, bases, or solvent mixtures



Tyvek suit



Chemical resistant sleeve apron



Nomex hood

Be sure you know that the material will protect you against the hazard & that it is not damaged or defective!!



WASTE MANAGEMENT

Waste Management

HAZARDOUS WASTE

ACCUMULATION (Check box if satellite)

Solid Waste Liquid Waste Mixed Waste

Ignitable (Flashpoint < 140°F) _____

Reactive Toxic

Corrosive (pH<2.0) or (pH>12.5) _____

Start Date: ___/___/___ Fill Date: ___/___/___

Contact Name: _____ Department/Building/Tenant: _____

Chemical contents (product name or major chemical component): _____

**HANDLE WITH CARE!
CONTAINS HAZARDOUS OR TOXIC WASTES**



Hazardous Waste

UNIVERSAL WASTE

SHIPPER _____

ADDRESS _____

CITY, STATE, ZIP _____

CONTENTS _____

ACCUMULATION START DATE _____



Universal Waste

NON-HAZARDOUS WASTE

OPTIONAL INFORMATION:

SHIPPER _____

ADDRESS _____

CITY, PROV. STATE POSTAL CODE _____

CONTENTS _____

NON-HAZARDOUS WASTE



Non-hazardous Waste



Other Exempt Waste

Other Wastes

- Non-Hazardous Waste
 - Does not meet the EPA Hazardous Waste criteria
 - Do not pour down drain or put in trash
 - Label with “Non-Hazardous Waste” Label and put in Satellite Accumulation Area (SAA)
- Universal Waste
 - Batteries, Lamps & Mercury containing devices ONLY
 - Label and put in SAA
 - Indicate type of items (i.e. bulbs) and date



Hazardous Waste

- EPA Characteristic Hazardous Waste
 - Ignitable (FP <140o F)
 - Corrosive (pH <2 or >12.5)
 - Reactive (e.g., can react w/ H2O to form gases)
 - Toxic
- Hazardous waste containers/bags:
 - Must be Labeled
 - Good condition
 - Closed at all times (no funnels)
 - Waste is compatible with container
 - Incompatibles must be separated!

HAZARDOUS WASTE

ACCUMULATION (Check box if satellite)

Solid Waste Liquid Waste Mixed Waste

Ignitable (Flashpoint < 140°F) _____

Reactive Toxic

Corrosive (pH<2.0) or (pH>12.5) _____

Start Date ___/___/___ Fill Date ___/___/___

Contact Name: _____ Department/Building/Tenant: _____

Chemical contents (product name or major chemical component):

HANDLE WITH CARE!
CONTAINS HAZARDOUS OR TOXIC WASTES

How to complete a Hazardous Waste Label

- Check Type: **SOLID** or **LIQUID** or **MIXED**
- Check Hazard: **IGNITABLE, CORROSIVE, TOXIC** or **REACTIVE**
- **START DATE:** the date you first put waste into the container.
- **FILL DATE:** the date you place the full container in the satellite accumulation area.
- Write **NAME** of person responsible for generating waste and their department.
- **CONTENTS:** Name of the chemical(s) that makes the waste hazardous

Satellite Accumulation Areas



- Place properly labeled waste in the satellite accumulation area
- Needs to have spill containment
- Only 1 container per waste stream (max of 55 gallons)
- Move to 90-Day Storage Area within 3 days of being filled
- Use different shelves or secondary containers for different waste streams to keep incompatible waste apart

Empty Container Guidelines

- Empty bottles that once contained flammable/solvents should be placed in dedicated, labeled bins.
- MUST be capped before placing into the correct bin.
- NowPak containers should not be placed in bins, must treat them as Hazardous Waste
- Other trash should not be placed in these bins.

Chemical Waste

- Do not put ANY chemicals down the drain or in the trash
- Chemical waste goes in Satellite Accumulation Areas
- Broken glass needs to be placed in a hard-walled container before disposal
- Broken wafers go in the wafer disposal bins
- Waste disposal is the responsibility of the generator
 - Generator: Any person whose act or process creates hazardous waste.
- Contact EHS with any disposal questions: SUNYPOLYEHS@sunypoly.edu or Kasey Rydberg-Environmental Engineer: Krydberg@sunypoly.edu

GENERAL SAFETY AND QUALITY POLICY

ACCIDENT PREVENTION SIGNS

- Danger signs: Indicate immediate danger and that special precautions are necessary
- Caution signs: Indicate a possible hazard against which proper precautions should be taken
- Safety instruction signs: indicate general instructions on safety measures



SAFETY NOTICE

**SAFETY GLASSES
REQUIRED IN
THIS AREA**

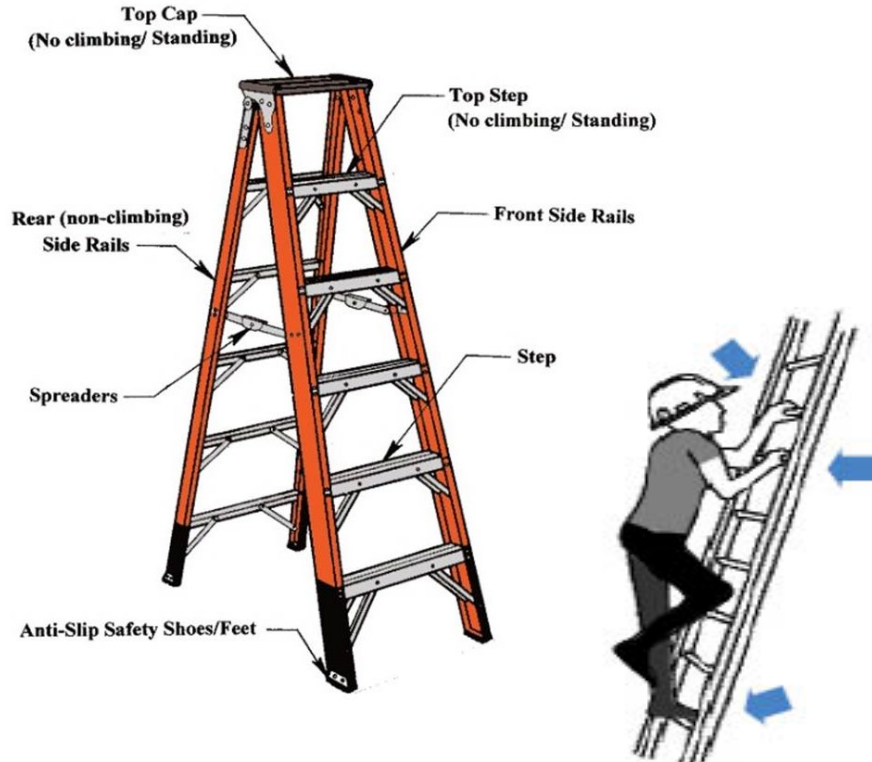
DANGER

**AUTHORIZED
PERSONNEL ONLY**



Ladder Safety

Do not use the top 2 steps/rungs of a ladder as a step/rung unless it was designed for that purpose



- Always inspect the ladder for damage prior to using it.
- Follow manufacturer instructions and ladder labels.
- Face the ladder while climbing up or down.
- Check for and avoid overhead power lines.
- Only put ladders on a stable, level surface.
- Keep slippery materials away from ladders.
- Use a barricade to keep traffic away.
- Maintain 3 points of contact (two hands and a foot or two feet and a hand.)



Electrical Safety

Only authorized, qualified and trained personnel are allowed to work on electrical equipment, circuits and parts

- **Do not:**

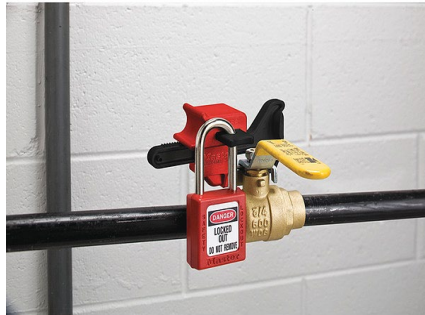
- Overload electrical outlets
- Use damaged electrical cords (worn/frayed insulation or exposed wires)
- Daisy chain (plug an outlet strip into an outlet strip, etc.)
- Use extension cords in place of permanent wiring.

- **Do:**

- Inspect wiring, power cords, and electrical tools before use for damage to cords
- Use GFCI in areas with water
- Use extension cords with a GFCI for temporary or portable equipment
- Report any electrical shocks

The Control of Hazardous Energy (Lockout/Tagout) (LOTO)

- Used to safeguard employees from the unexpected startup of machinery and equipment or the release of hazardous energy during service or maintenance activities
- Employees must be authorized and trained to do LOTO and perform maintenance of equipment
- Do not defeat, tamper with, ignore, or operate any devices, or start up any machines or equipment that is locked or tagged out
- The tags and locks shall only be removed by the authorized person who attached them



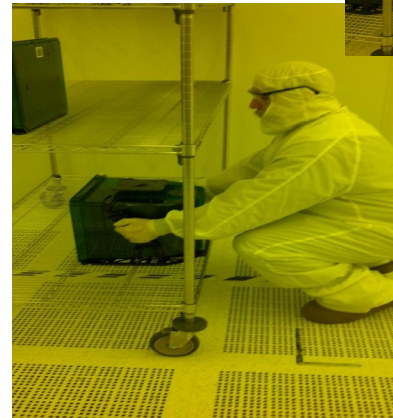


Housekeeping

- Ensure emergency exits, aisles, fire extinguishers, safety showers and eye-wash fountains are unobstructed
- All doors (e.g. exit, stairwell) must be working properly (door hardware and latching devices operating correctly)
- Keep storage at least 18 inches below fire sprinkler heads
- Keep drawers and doors of desks, cabinets, etc., closed when they are not being used
- Be sure that emergency exit signs are readily visible, and the illuminated type emergency exits signs are in fact lit
- Demonstrate positive housekeeping and cleanliness of our facility, by keeping work areas clean and organized
- Take corrective action when appropriate!

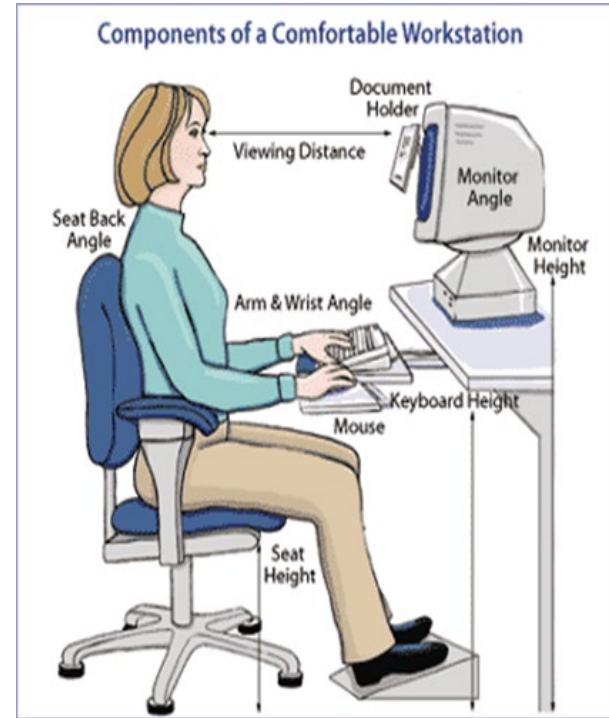
Ergonomic Lifting Guidelines

- The safe lifting zone is between the knees and shoulders
- Push items rather than pull them
- Bend at the knees, not the waist
- Keep the load close to the body and use both hands
- DO NOT twist
- Use a step ladder for all lifts above shoulder height



Ergonomics

- Repetitive motion injuries make up a majority of musculoskeletal occupational injuries
- Warning signs: Pain, serve discomfort, numbness, tingling
- Contact EHS for an ergonomic assessment of your workstation or operation if needed



Ergonomic Risk Factors:

Repetition

- the number of a similar exertions performed during a task

Contact Pressure

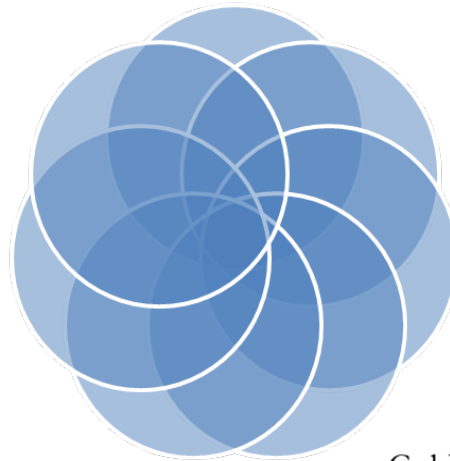
- resting a body part (elbow) on a hard surface for support

Vibration

- using jig saws, grinders or sanders

Excessive Force

- lifting more than 50 pounds



Awkward Postures

- kneeling or squatting for more than 2 hours total per day

Static Postures

- holding the same position or using the same muscles for long periods of time

Cold Temperatures

- Temperatures lower than normal room temperature

Cleanrooms and chemical storage areas have a number of potential hazards such as...

- Physical and mechanical hazards (e.g., flammable, pyrophoric, compressed gases)
- Chemical exposures (e.g., Corrosives, Toxics)
- Electrical hazards
- Radiation
- Laser
- Ergonomics
- Slips/trips/falls

Some ways you could be exposed...

- Exposure can occur while working on equipment when you:
 - DO NOT Turn off gases/chemistries and Lock Out Tag Out (LOTO) equipment properly.
 - DO NOT Remove any residual pressure from lines
 - DO NOT Wear adequate PPE to minimize exposure
 - Work with/on equipment that is faulty
 - Defeat safety interlocks
- ALWAYS follow safety requirements, work procedures and obtain the necessary training to perform your work.

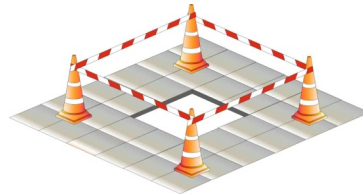


Safety Interlocks/Shields/Guards

- A safety interlock, shield, cover, and/or guard is a means of safeguarding the employee from the hazard.
- Safety interlocks are designed to work together with hinged, sliding, or lift-off doors, guards and/or barriers.
- When the door/guard/barrier is opened, the power supply to the equipment it is guarding is disconnected.
 - Example: Laser safety Interlock
- DO NOT DEFEAT SAFETY INTERLOCKS unless authorized to do so*
- Ensure that interlocks, shields, and/or guards are restored and in place after activity is completed

Raised Metal Floor

- The removal of raised floor tiles requires the approval from the technical coordinator.
- Barriers or barricades such as safety cones, chains, 'caution' or 'danger' tape, shall be used around floor openings in the cleanroom to prevent a falling hazard.
- Limit the number of floor tiles to be removed and the duration of their removal.



Permits

- For Hot Work Permits contact the Facilities Manager (585-576-7734).
- This includes producing any heat, spark or open flame work
- For any alarm system or sprinkler system work contact the Facilities Manager (585-576-7734).

Closing

- NY CREATES is committed to providing you a safe working environment.
- You are a key player in this effort.
- All individuals onsite are expected to share that commitment.
- Each of us must comply with safety and environmental laws and safety requirements.
- Thank you in advance for your support and efforts toward workplace safety and health.



Please complete quiz and submit as instructed

<https://sunypoly.edu/environmental-health-and-safety/rochester/training-education.html>

Quiz located above.