



**Commonwealth of Massachusetts
Executive Office of Labor and Workforce Development
Department of Labor Standards**

**WHY TOXICS USE REDUCTION
IS IMPORTANT FOR
WORKER HEALTH AND SAFETY**

**Charlie Baker, Governor
Karyn Polito, Lieutenant Governor**

**Ronald Walker, Secretary
EOLWD**

**William McKinney, Director
Department of Labor Standards**



TURA and Worker Health and Safety

- ▶ I thought TURA was an environmental law...
 - Worker protection is part of the law and part of TUR planning.
 - Workers are on the front line of effects from toxic chemicals.
 - Workers will have the **first** and **highest** exposures to chemicals used in industrial and commercial settings in their original and most concentrated form.
 - Environmental releases and exposures will potentially happen down the line, but chemical concentrations would likely have been diluted by then. (exception, management of untreated hazardous waste, TSD workers).



Aren't Workers Already Protected?

- ▶ What about:
 - OSHA Standards and OSHA Enforcement?
 - Training?
 - Hazard Communication / Right-to-Know?
 - Personal Protective Equipment (e.g. gloves, respirators)?
 - Engineering Controls such as Ventilation?
 - Internal EHS Staff?

- ▶ Shouldn't all these factors ensure workers are safe from harmful chemical exposures?
Unfortunately, the answer is no.



32 millions workers work with and are potentially exposed to one or more chemical hazards.

OSHA Publication 3084

“Thousands of workers still are becoming ill and dying as a result of exposure to hazardous chemicals.” –David Michaels, Assistant Secretary of Labor, OSHA (2014)

OSHA has various standards to ensure workers are not exposed to dangerous levels of hazardous chemicals at the workplace.





What are the Risks?

- ▶ Health Effects
 - Cancer
 - Brain Damage
 - Central Nervous System Damage
 - Infertility and Other Reproductive Effects
 - Organ Damage
 - Chronic Respiratory Impairment
 - Blindness
 - Asthma
 - Burns
 - Asphyxiation
 - Many Others



When are workers at a health risk from toxic chemicals?

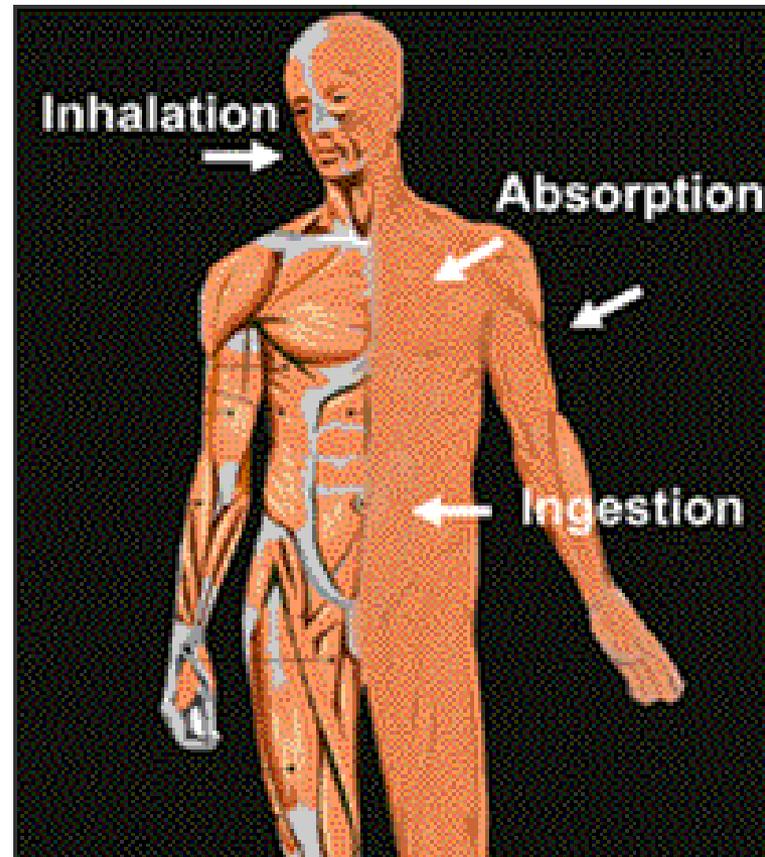


- ▶ The chemical must get onto or into the body, aka, there is a chemical exposure
- ▶ Enough chemical must get into the body to cause harm (sufficient dose)
 - There is NO safe dose for carcinogens

How Do Chemicals Get Into Your Body?



- ▶ **Breathing it in (Inhalation)**
 - Typically this is greatest exposure risk
- ▶ **Swallowing (Ingestion)**
 - If you get the chemical on your hands and then eat or smoke, this is one way the chemical can get in
- ▶ **Absorption through the skin**
- ▶ **Piercing of skin with sharp object (Injection)**



What are the Risks?

▶ Physical Hazards

- Flammable



- Explosive



- Reactive





OSHA Standards

- ▶ Exposure Limits are the maximum amount of a chemical, by law, to which a worker can be exposed.
 - Most of these have to do with respiratory exposure, how much of the chemical a worker can breathe in over an 8 hour shift (PELs)
- ▶ Why Don't Exposure Limits Fully Protect Workers?
 - The regulatory limits are often set higher than what science shows is a safe limit (e.g. lower NIOSH and ACGIH limits (RELs and TLVs).
 - Many of these limits are decades old, because it is very hard to change these regulations. These old standards are not reflecting new scientific information.
 - Monitoring to check exposures versus the limits is often not conducted.
 - Not all facilities will be inspected by OSHA. Also, there have been cases where a company chose to just risk paying fines rather than following the regulations.
 - It is possible to get a lower fine for killing an employee than for labeling and paperwork violations for hazardous waste.



OSHA Standards

- ▶ **Personal Protective Equipment**
 - The OSHA standards just say it is needed, it is up to the employer to identify the appropriate protection for the chemical in use and the task.
 - Correct selection, use, and maintenance is complicated and easy to get wrong.





Hazard Communication / Right to Know

- ▶ Workers have the right to know about the risks of the chemicals they work with on-the-job through:

- Training
- Container Labeling
- Safety Data Sheets (SDSs)

- ▶ Hearing directly from workers has shown time and again that despite these laws many do not understand the risks from chemicals.

Section 2. Hazards identification	
OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	: FLAMMABLE LIQUIDS - Category 4 SKIN SENSITIZATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation and Narcotic effects) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2 Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 98.7%
GHS label elements	
Hazard pictograms	:
Signal word	: Warning
Hazard statements	: Combustible liquid. May cause an allergic skin reaction. May cause respiratory irritation. May cause drowsiness and dizziness. May cause damage to organs through prolonged or repeated exposure.
Precautionary statements	
General	: Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.
Prevention	: Wear protective gloves. Wear eye or face protection. Keep away from flames and hot surfaces. - No smoking. Use only outdoors or in a well-ventilated area. Do not breathe vapor. Contaminated work clothing should not be allowed out of the workplace.



HazComm / RTK Training

- ▶ This is a tough subject on which to deliver accessible, understandable, and effective training.
- ▶ Often, a general training on chemical hazards is provided, but workers are given no useful information about the chemicals they actually work with and how to protect themselves.





HazComm / RTK

- ▶ SDSs, with pictograms and risk statements, are better than MSDSs, but still hard for workers to understand and use. This is really the only source of information on chemical hazards provided for workers.



- ▶ Labeling provides limited information.
 - May not be clearly understood.
 - Example, workers using a product at full strength that is meant to be diluted, and being overexposed.





Some Worker Beliefs

- ▶ “I can’t smell the chemical so I am safe”
- ▶ “I don’t feel sick or dizzy or anything so the chemical isn’t doing anything to me”
- ▶ “They just wouldn’t buy something for us to use that could cause cancer”
- ▶ “The boss told me to wear this thing (a respirator), I don’t know why”



More Worker Beliefs

- ▶ “This is just from old age.”



- ▶ “I have been working with this stuff for years and nothing has ever happened to me.”
- ▶ Workers are concerned about “exotic” chemicals, such as what’s in the lab, but complacent about “everyday” chemicals, such as solvents like degreasers or paint thinner.



Engineering Controls

- ▶ In many of my inspections, testing of ventilation systems showed it was at reduced capacity or no longer working.
 - Material gets caught up into local ventilation hoses causing blockages.
 - Fans are no longer operational.
 - There is no inspection and maintenance program.
- ▶ In some cases, ventilation systems were not designed or installed properly.
- ▶ Closed-loop systems (full containment).
 - Sometimes they leak and/or fail.
 - Chemical is still handled during charging and maintaining the system.



Personal Protective Equipment



- ▶ Effective respiratory protection requires:
 - Medical screening
 - Respirator fit testing
 - Knowledge of airborne concentration of the air contaminant (e.g., monitoring has been done)
 - Knowledge of respirator assigned protection factors
 - Selection of appropriate respirator for the task
 - Selection of appropriate cartridges for half-face respirators
 - Cartridge replacement schedule (saturation capacity)
 - Training and oversight on proper use and maintenance of the respirator
 - That workers wear their respirators



Respiratory Protection Failures

- ▶ Employees wearing half-face respirators with a HEPA cartridge on the right side and an organic vapors cartridge on the left side.
- ▶ Q: to employee “How often do you change out those cartridges.”
- ▶ A: “What? You’re supposed to change these?”
- ▶ Dirty, unprotected respirator left out in the area of chemical exposure when not in use.
- ▶ Respirators with a visibly poor fit. Employees with heavy beards wearing respirators.



TUR – A Better Approach to Reduce Worker Protection Requirements



- ▶ There have been isolated cases where employers go to great lengths to avoid worker protection requirements, and conduct illegal and harmful activity.
 - Example, workers were being given chelating agents as “medicine” to mask their blood lead levels and avoid fines for overexposing employees.

- ▶ Toxics use reduction can achieve the same goal in a straightforward and above-board manner. Use of less harmful and therefore less-regulated chemicals reduces worker protection requirements.



Chemical Safety Knowledge

- ▶ Those who have knowledge of chemistry or operations involving chemicals may not have knowledge of chemical hazards. These are smart, dedicated people, they just did not receive this information in their education and training.
 - High school science teacher (and all of his students) washing glassware in a tub of carbon tetrachloride with bare hands.
 - Owner of battery recycling operation so overcome with body twitches from lead exposure he can barely walk.
 - Firefighters at plant fire hitting lithium batteries with water, creating shooting flames.
 - Operators at a water treatment facility unaware of the very serious risk from hydrofluoric acid (HF was present in their fluoridation agent).
 - Picric acid (a shock-sensitive, explosive material) being used as a door stop at a laboratory.



EHS Staff

- ▶ There is no guarantee their recommendations will be put into action by management.

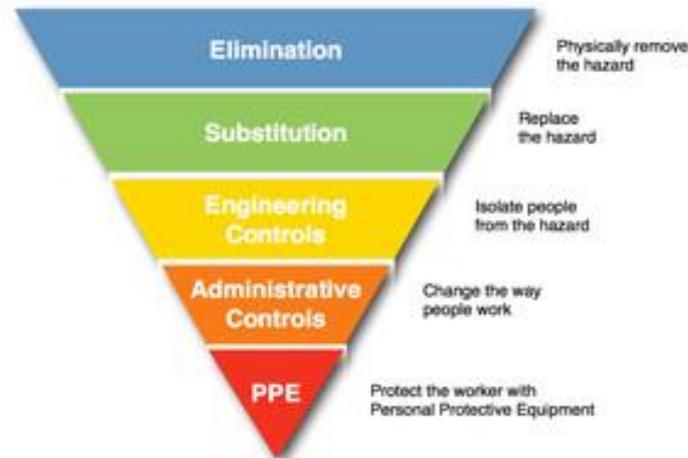


- ▶ Sometimes, staff without any training and education in health and safety, are given this responsibility.



Hierarchy of Controls

Hierarchy of Controls



- ▶ The bottom line: employees remain at risk when using harmful chemicals, in spite of efforts and controls to try and keep them safe.
- ▶ Reducing use of harmful chemicals greatly increases worker safety.



Discussion

- ▶ Do you know what your workers' perceptions are about the toxic chemicals in your workplace?
- ▶ Where are you making assumptions that workers are protected from exposure, and this may not be true?