

## Shop Safety: Health & Ventilation

UW Extension Webinar  
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**OSHA** Occupational Safety and Health Administration


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## Session Topics

1. Organization
  - walk paths, shelving, work areas
2. Equipment and tools
3. **Ventilation**
  - **vehicle exhaust and welding areas**
4. Lockout/tagout including electrical safety
5. Lifting and blocking
  - slings, chains and rigging


## Industrial Hygiene from an OSHA Perspective

- Focus on workplace health hazards
- Goal: reduce or eliminate hazards that can cause sickness or impaired health
- Identify & analyze workplace health hazards
  - \* chemical
  - \* physical
  - \* ergonomic
  - \* biological




## Health Hazards in Shops

- Paint and Painted Surfaces
  - Lead, Cadmium, Hexavalent Chromium (John Deere Green)
    - Dust (Grinding)
    - Fume (Welding/Cutting)
- Welding Fume:
  - Galvanized (Zinc Oxide)
  - Stainless Steel = Hexavalent Chromium
- Carbon Monoxide
  - Idling Engines
  - Heating units (Temporary/Permanent)
- Solvents – Parts Cleaner
- Fuels, Lubricants
- Noise: Air Compressor, Engines, Impact Wrenches




## Hazard Communication

(M)SDS Sheet



## Labeling Example

HCS/GHS Labeling Components



**PAINT (METHYL FLAMMALINE, LEAD CHROMOMIUM)**

**DANGER**

Causes damage to the liver and kidneys through prolonged or repeated exposure to the skin.

Keep away from food and drink.

Wash hands thoroughly after use and before eating.

Highly flammable liquid and vapour.

Keep away from heat and ignition sources.

**FIRST AID**

Call emergency medical care.

Wash affected area of body thoroughly with soap and fresh water.

Great Lake Paints Inc., Columbus, Ohio, USA.  
Telephone 999 999 9999

**Pictograms**

- Conveys specific information about the hazard(s) of a chemical

**Product Identifier**

- Chemical name or number to identify the chemical

**Signal Word**

- Alerts level of severity of hazard

**Hazard Statement**

- Describes the nature of hazard(s) associated with a chemical

**Precautionary Statement**

- Recommended measures to take to prevent adverse effects

**First Aid Statement**

- Emergency care information

**Supplier Information**

- Name, address and telephone number of the chemical manufacturer, importer or other responsible party

### Hierarchy of Controls

Most Effective

↓

Least Effective

|   |
|---|
| 1) Elimination or Substitution                          |
| 2) Engineering Controls<br>(Safeguarding Technology)    |
| 3) Warnings   |
| 4) Training and Procedures<br>(Administrative Controls) |
| 5) Personal Protective Equipment                        |

### “Sand Blasting” Rarely Done Adequate Media Substitutions

The following control measures have been used to minimize exposure to silica in workplace operations involving abrasive blasting:

### Less Hazardous Cleaning Chemical

### Carbon Monoxide

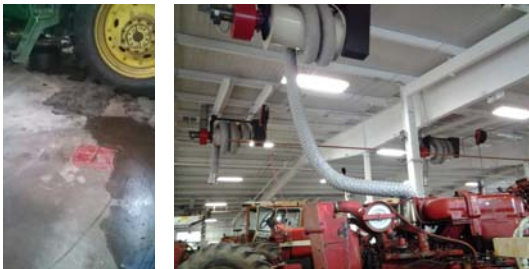
- Odorless – Tasteless
- Quickly Generated
- Respirators don't help
- Ventilate when idling engines

### Service Truck Idled in Closed Shed: Worker Died from CO

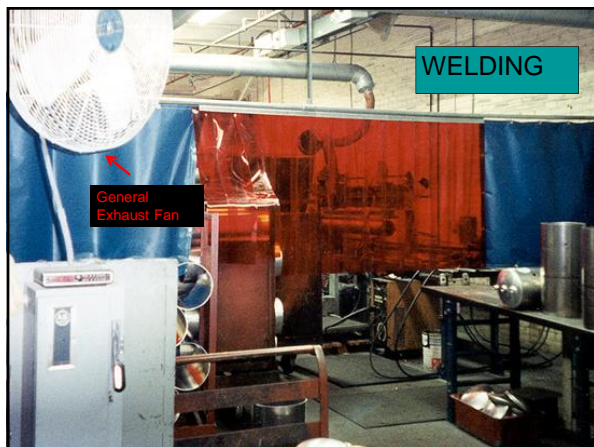
### Vehicle Exhaust Extractors

WITC, Agricultural Mechanic Shop, in New Richmond has this type of unit. Works great for them.

[ Ceiling or Floor Exhausts ]



[ Exhaust Other Appliances  
Pressure Washers/ Temp Heat ]



[ Flammable Cylinders ]

- Oxygen and acetylene stored together
- Must be 20 feet apart or have a ½ hour noncombustible fire barrier



Empty Drum Containing Old Xylene Vapors Exploded When Torch Cut.  
1910.252(a)(3)(i)




[ Hot Work Permits: Combustibles  
& Ignitable Vapors ]

- 1910.252(a)(1)(i) Fire hazards.
  - If the object to be welded or cut cannot readily be moved, all movable fire hazards in the vicinity shall be taken to a safe place.
- 1910.252(a)(1)(ii) Guards.
  - If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards shall be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards.



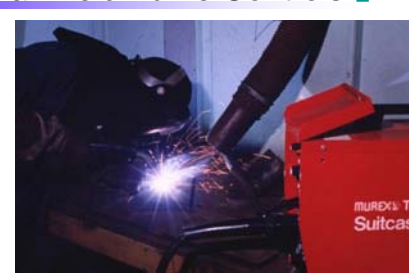
### Controls or Abatement Methods

- Air Contaminant
  - Local Ventilation
    - Flexible Exhaust Hoses Positioned at Work
    - Vacuum Provided in the Torch
  - General Ventilation: Not effective for Workers
    - Eliminate the "blue haze"
    - Down Draft Curtain



### Traditional Weld Fume Controls

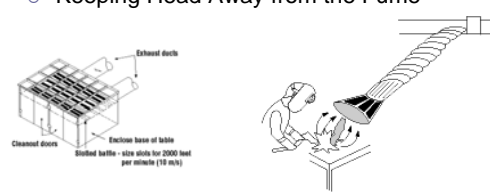
- Segregation
- LEV (Local Exhaust Ventilation)
- PPE



noise, aerosol, gas, radiation


### Controls or Abatement Methods

- Work Practices with Eng. Controls:
  - Using the Ventilation Correctly
  - Keeping Head Away from the Fume





### PPE & Apparel

- Jewelry: NO Rings
- Safety Glasses
- Steel Toed Shoes
- No Loose or Torn Clothing
- Hand and Arm Protection
  - Heat, Chemical, Sharp Edges
- Leathers for Welding/Welding Helmet
- Respirators?



### Occupational Noise Exposure

- Assess your workplace!
  - Monitor areas of concern
  - Sample worker's full-shift noise exposure
  - High Impact Noise:
    - Dual Protection: Muffs and Plugs





### What if your workers are required to wear respirators?

- Written program
- Respirator selection
  - Must be appropriate for hazard
  - If selecting a gas or vapor cartridge respirators, must develop cartridge change-out schedule (unless it has an ESL)
- Medical Evaluations
- Fit testing
- Proper use of respirators
- Continued effectiveness
  - Cleaning, disinfecting, storage
- Training


### Fit Testing

- Before the use of any negative or positive TIGHT FITTING face piece respirator

### Voluntary Respiratory Use

- What if you allow voluntary use of other types of respirators?
- Must have written respirator program that provides for:
  - medical evaluation,
  - cleaning, maintenance
  - & storage of respirators



### Summary

- Evaluate your health hazard
  - Air Monitoring
- Use the Hierarchy of Controls
- Ventilate Vehicle Exhaust
- Ventilate Welding Exhaust
- Don't rely on PPE

