Formaldehyde Safety Training
Overview

- Introduction to OSHA Standard for Formaldehyde
  - Requirements of regulation
  - Permissible exposure limits (PELs)
- Routes of exposure and health effects
- Protective measures
- Handling and storage of formaldehyde
- Spills and accidents
- Medical surveillance
- Waste management
OSHA regulates occupational exposures to formaldehyde

Scope of 29 CFR 1910.1048

- This standard applies to all occupational exposures to formaldehyde, including exposure to:
  - formaldehyde gas
  - formaldehyde solutions (formalin)
  - materials that release formaldehyde
29 CFR 1910.1048: Formaldehyde

Requirements:
- Must have an MSDS available in the lab
- Written training materials must be available to employees
- Must establish “regulated areas” where airborne concentrations of formaldehyde exceed the OSHA permissible exposure limits (PEL) and/or short-term exposure limits (STEL)
- Medical surveillance must be provided to employees who may be exposed to formaldehyde at concentrations exceeding the PEL or STEL
- Exposure monitoring will be conducted if formaldehyde concentrations in the workplace exceed the action level
Permissible Exposure Levels

OSHA requires that regulated areas be established where airborne formaldehyde concentrations exceed the OSHA PEL and/or STEL values

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<tbody>
<tr>
<td>OSHA PEL (averaged over 8 h)</td>
<td>0.75 ppm</td>
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<tr>
<td>OSHA STEL (maximum of 15 min/day)</td>
<td>2 ppm</td>
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<tr>
<td>OSHA Action level (averaged over 8 h)</td>
<td>0.5 ppm</td>
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<tr>
<td>ACGIH STEL (maximum of 15 min/day)</td>
<td><strong>0.3 ppm C</strong></td>
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Note, this is a ceiling value that must never be exceeded

- A written plan must be developed and implemented whenever an employee is exposed above the PEL
Regulated Areas

- Regulated areas shall have danger signs posted at entrances and access ways

![Danger Sign]

- Only authorized personnel shall enter regulated areas
Potential health hazards: acute

Exposure routes

- Inhalation
  - Sore throat, coughing, shortness of breath
  - Sensitization of respiratory tract
  - 25-30 ppm: pulmonary edema and pneumonitis

- Ingestion
  - Severe abdominal pain, violent vomiting, headache, diarrhea, unconsciousness and death
  - Methanol used to stabilize the formaldehyde solution poses additional toxic hazards
Potential health hazards: acute (cont.)

- Exposure routes (cont.)
  - Skin contact
    - Irritation and/or burns; cracking, scaling, white discoloration
    - Can be absorbed through skin
  - Eye contact
    - Irritation from vapors, pain, blurred vision
    - May cause irreversible damage if splashed in eyes
Potential health hazards: chronic

- Long-term effects
  - Sensitizer:
    - May cause contact dermatitis, other allergic reactions
  - Vision impairment and liver enlargement from methanol
  - Carcinogen
    - May cause cancer
  - Mutagen
    - May cause mutations in DNA
Know how to report exposures and illnesses/injuries that are related to the job
- Tell your supervisor immediately
- Remember: symptoms develop over time, so adverse effects may not be immediately noticeable

The perception of formaldehyde by odor and eye irritation becomes less sensitive with time as one adapts to formaldehyde
- This can lead to overexposure if a worker is relying on formaldehyde's warning properties to alert him or her to the potential for exposure
Protecting yourself: Engineering and work practice controls

- Primary methods of exposure control
  - Engineering controls:
    - Always use formalin in a chemical fume hood
    - Check that it is properly functioning
  - Work practices:
    - Use the smallest amount of formalin necessary
    - Buy in smaller quantities
    - Use safer alternatives whenever possible
Personal protective equipment

- For working with 37% formalin or 10% formalin:
  - **Protective clothing (lab coats, aprons, suits):**
    - Tychem® CPF2, SL, CPF3, F, CPF 4, BR, LV, Responder, TK, or Reflector all have breakthrough times >480 min
  - **Gloves (required when using >1% formalin):**
    - Nitrile (>360 min) is the best choice
    - Neoprene (105 min), or PVC (100 min) are ok
    - Rubber or Neoprene/rubber are ok for short use (10-15 min)
    - PVA gloves are **not recommended**
For working with formalin at any concentration, splash-proof goggles are required.

Formaldehyde contact with the eye can range from transient discomfort to severe, permanent corneal clouding and loss of vision.
Storage of PPE
- Store away from sources of formaldehyde
  - Formaldehyde vapors can permeate the lab coat or glove material, reducing its barrier-properties

Inspect all PPE prior to use
- Check for holes, cracks, degradation

Change gloves frequently
- Just because the breakthrough time is >360 min doesn’t mean you should use one pair of gloves for 6 hours.

Do not reuse disposable gloves
Personal protective equipment (cont.)

- Respirators are **required**
  - during periods necessary to implement engineering and work practice controls
  - in operations where engineering controls and work practices are not feasible
  - in operations where engineering controls and work practices do not prevent exposure below the PEL
  - in emergencies (spill response)
- If you use formalin in a fume hood, you should not need to wear a respirator
Respirator use follows the requirements given in 29 CFR 1910.134:

- Employees must wear respirators if they are required to do so
- If required to wear a respirator, employees must have a medical exam (once) and be fit tested (annually)
  - If you feel you need a respirator, contact EHS for further guidance.
Medical surveillance

- Medical surveillance is required
  - prior to assignments to areas where exposure may be above STEL
  - at least annually where exposure may be at or above the STEL
  - whenever an employee shows signs/symptoms of toxic levels of exposure
- Exposure levels are determined without regard to respirator use
Medical surveillance includes:

- administration of medical disease questionnaire
- determination if a medical examination is necessary
- examinations for employees who are at increased risk for exposure to formaldehyde
Medical surveillance (cont.)

- Medical examinations include:
  - a physical exam
  - laboratory examinations
  - any other necessary tests
  - counseling of employees

- Written physician opinions include:
  - physician’s opinion about employee’s medical condition
  - recommended limitations
  - statement of medical conditions
Medical surveillance (cont.)

- Employees get copies of the written opinions within 15 working days

  • Records are retained for the duration of employment plus 30 years
Spills and other Emergencies

- If you spill a formaldehyde, or any other hazardous chemical, and no one is hurt, and there is no risk of fire or explosion, ask yourself if you can manage that spill.

- Do you:
  - Know what was spilled?
  - Know the chemical hazards of the spill?
  - Have suitable personal protection?
  - Have cleanup supplies?
Spills and other Emergencies

- For minor spills, call EHS at 974-5084 if you feel you cannot handle the situation.
- For major spills, or incidents that happen after hours, please call UT Police at 911.
- Remember that any waste generated from a spill cleanup of a hazardous waste or chemical must be managed as a hazardous waste.
Waste Disposal

- Collect all formaldehyde containing wastes in a well-labeled, clean container or double bag
  - No formaldehyde should ever be put down the drain or in the trash
  - Clearly label container with UT hazardous waste label
  - Store waste in closed containers.
- When the container is full, please bring to one of the Waste Rooms or contact EHS at 974-5084.
Waste can be brought to the following locations for disposal:

- Walters Waste Room WLS M-209
  Wednesdays 1:00–2:00 p.m.
- SERF Waste Room @ loading dock 2nd Floor
  Wednesdays 2:00–3:00 p.m.
- Do not leave waste unattended!!!
Quiz Time

To complete the Formaldehyde Safety Training Module, please [click here](#) for the quiz.