

**FISH AND WILDLIFE SERVICE
OCCUPATIONAL SAFETY AND HEALTH**

Occupational Safety and Health

Part 242 Industrial Hygiene

Chapter 9 Formaldehyde Exposure Control

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9.1 What is the purpose of this chapter? This chapter:

A. Provides U.S. Fish and Wildlife Service (Service) policy requirements that we must implement to ensure the safety of personnel who may be exposed to formaldehyde hazards within their work environment, and

B. Describes the minimal procedures you must follow to protect yourself from occupational illness or injury associated with formaldehyde use.

9.2 What is the Service policy regarding formaldehyde exposure control? Our policy is to prevent occupational illness or injury associated with exposure to formaldehyde or formaldehyde-containing materials by:

A. Establishing procedures and controls that are designed to eliminate exposure or to minimize formaldehyde exposures to levels below the Occupational Safety and Health Administration's (OSHA) permissible exposure limit of 0.75 parts per million (ppm), and

B. Monitoring your exposure to formaldehyde or formaldehyde-containing compounds.

9.3 What is the scope of this chapter?

A. This chapter applies to all employees and contractors whose duties require them to work with or visit Service facilities engaged in formaldehyde-related work activities. It does not provide guidance or protective measures for dealing with construction products containing formaldehyde for which we may have concerns about off-gassing.

B. These facilities include, but are not limited to:

(1) Fish hatcheries,

(2) Fisheries offices,

(3) Ecological Services offices,

(4) National Wildlife Refuges,

(5) The National Conservation Training Center (NCTC) Science Laboratories, and

(6) The Service Forensics Laboratory.

9.4 What are the authorities for this chapter?

A. Occupational Safety and Health Act (of 1970) Federal Agency Safety Programs and Responsibilities (Public Law 91-596, Sec. 19).

B. OSHA Standards, Formaldehyde (29 CFR 1910.1048).

C. Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters (29 CFR 1960).

D. Executive Order 12196, Occupational Safety and Health Programs for Federal Employees.

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- E. OSHA Standards, Hazard Communication (29 CFR 1910.1200).
- F. OSHA Standards, Occupational Exposure to Hazardous Chemicals in Laboratories (29 CFR 1910.1450).
- G. 485 DM 17, Industrial Hygiene Program and the Occupational Medicine Program Handbook.
- H. Department of the Interior Occupational Medicine Program Handbook, Tabs 8 and 12(E2), Specific Medical Program Requirements.

9.5 Who has responsibilities for formaldehyde exposure control?

A. The Director:

- (1) Ensures that we maintain an effective and comprehensive occupational safety and health program, and
- (2) Approves our formaldehyde exposure control policy.

B. The Assistant Director – Business Management and Operations ensures that:

- (1) We have a formaldehyde exposure control policy, and
- (2) The Washington Office provides sufficient support and resources to implement the policy.

C. The Chief, Division of Safety and Health:

- (1) Revises and updates this chapter, as necessary, and
- (2) Interprets formaldehyde exposure control requirements and tries to resolve Servicewide questions or issues related to formaldehyde.

D. Regional Directors and the **Director, NCTC** ensure that sufficient resources and support are provided to implement an effective and comprehensive formaldehyde exposure control program within their respective Regions and the NCTC Laboratory.

E. Regional Safety Managers:

- (1) Serve as technical advisers to managers and Collateral Duty Safety Officers for the formaldehyde exposure control program in their Region,
- (2) Interpret formaldehyde exposure control requirements and work to resolve Regionwide questions or issues on the topic,
- (3) Coordinate or assist with exposure evaluations and exposure sampling, as necessary, and
- (4) Review the use of objective sampling data in lieu of performing actual sampling if requested.

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F. Project Leaders/Facility Managers/Supervisors must:

- (1) Evaluate operations, including the development of a Job Hazard Assessment (JHA), to identify potential exposures to formaldehyde and complete the subsequent actions if a potential exposure to formaldehyde exists;
- (2) Provide training to those involved with formaldehyde work;
- (3) Provide the necessary personal protective equipment (PPE);
- (4) Provide access, at no cost to the employee, to a medical service provider for those personnel who get sick or experience ill effects from working with formaldehyde or who are exposed at or above the OSHA action level or short-term exposure limit. The medical coverage must be consistent with the Federal Employees' Compensation Act; and
- (5) Ensure that their operations involving the use of formaldehyde comply with this policy and applicable Federal (OSHA) regulations. If there is a conflict, we must follow the stricter rule.

G. Employees must:

- (1) Successfully complete required formaldehyde exposure control training if exposed to or working in areas where formaldehyde is used,
- (2) Wear and maintain any PPE needed for formaldehyde-related activities, per manufacturer instructions,
- (3) Notify the Project Leader/Facility Manager/Supervisor if they are experiencing any adverse health effects, and
- (4) Not eat, smoke, or drink in or near the work area where formaldehyde is used.

9.6 What terms do you need to know to understand this chapter?

A. Formaldehyde is a colorless, flammable liquid with a strong, pungent odor. We use formaldehyde as a preservative or disinfectant. Pure formaldehyde is not available commercially because of its tendency to solidify. It is sold as aqueous solutions containing 37% to 50% formaldehyde by weight with varying amounts of methanol for stabilization.

B. Formalin is a water solution containing either 37%, 44%, or 50% formaldehyde solution and often containing up to 15% methanol, as a stabilizer.

C. Enclosed System. An enclosed system is an engineered means to transfer formalin or other formaldehyde-containing mixtures from supply containers to an end point, typically below the water line. This reduces or eliminates release of formaldehyde vapors into an employee's breathing zone and creating the potential for skin exposure.

D. Health Hazard. Mixtures or solutions comprised of greater than or equal 0.1% formaldehyde and materials capable of releasing formaldehyde into the air under any normal condition of use at concentrations reaching or exceeding 0.1 ppm are health hazards. See [Exhibit 1](#) for additional health hazard data. For specific definitions see "Health Hazard Definitions (Mandatory)" – 29 CFR 1910.1200, Appendix A.

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E. Job Hazard Analysis (JHA). FWS Form 2-2279 is an example of a JHA template. A JHA breaks down work activities, identifies potential hazards, and identifies how the work should be performed to prevent an accident or avoid a hazard.

F. Time Weighted Average (TWA). The TWA is the average of formaldehyde exposure levels during an exposure period.

G. Action Level. An AL is the airborne chemical (i.e., formaldehyde) vapor concentration, generally $\frac{1}{2}$ of the Permissible Exposure Level, that an average person can be exposed to during an average 8-hour work shift before requiring medical evaluation.

H. Permissible Exposure Level (PEL). OSHA's PEL is the airborne chemical concentration that an average person can be exposed to and not be harmed during an average 8-hour work shift.

I. Short-Term Exposure Limit (STEL). An STEL is an airborne chemical (i.e., formaldehyde) vapor concentration level over a continuous 15-minute time period.

J. Regulated Areas are work locations where the concentration of airborne formaldehyde exceeds either the OSHA PEL or STEL.

9.7 What formaldehyde exposure levels should Project Leaders/Facility Managers/Supervisors and employees be aware of?

A. The PEL for formaldehyde is 0.75 parts formaldehyde per million (ppm).

B. The AL for formaldehyde is 0.5 ppm as an 8-hour TWA.

C. The STEL for formaldehyde must not exceed 2.0 ppm over a 15-minute period.

D. More on Exposure Limits: You can find more information on OSHA's requirements for formaldehyde on [OSHA's Formaldehyde Safety and Health Topics Web site](#).

9.8 How do Project Leaders/Facility Managers/Supervisors evaluate operations to determine if their facility has formaldehyde exposure issues? Your Project Leader, Facility Manager, or Supervisor uses a JHA and baseline exposure air sampling to determine whether any work activities are creating hazardous formaldehyde exposure levels. The Project Leader/Facility Manager/Supervisor may contact your Regional Safety Office or the Division of Safety and Health for assistance and recommendations with exposure sampling.

A. The JHA (see 240 FW 1) helps break down the operations into sections so the Project Leader/Facility Manager/Supervisor can better identify exposure potential.

B. If baseline sampling indicates exposure levels at or above the AL for formaldehyde, the Project Leader/Facility Manager/Supervisor must ensure that personal airborne air sampling is performed every 6 months (also see section 9.10). If levels are greater than the STEL, they must sample once a year. Employee exposure must be below OSHA's PEL and STEL. Sampling results will determine to what extent the Project Leader/Facility Manager/Supervisor implements the requirements in this chapter.

C. If a facility can show, through either baseline exposure sampling or objective data from similar operations/facilities, that the presence of formaldehyde or formaldehyde-releasing products in the workplace will not result in personal exposure to airborne concentrations of formaldehyde vapor at or

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above either the AL or STEL, then further personal exposure monitoring is not required unless the processes change. The use of objective data in lieu of actual site-specific sampling must be reviewed by the Regional Safety Manager or the Division of Safety and Health.

9.9. Does the Project Leader/Facility Manager/Supervisor have to notify employees of personal sampling results? Yes. Your Project Leader/Facility Manager/Supervisor must:

- A. Notify you within 15 days of receipt of the results, and
- B. Either provide notification in writing or post it in a location where all employees can read it.

9.10 When does the Service require controls to reduce your exposure to formaldehyde? Whenever formaldehyde exposure levels are greater than OSHA's PEL of 0.75 ppm for an 8-hour TWA, your Project Leader/Supervisor/Facility Manager must develop controls to reduce those levels. They may consult with the Regional Safety or Engineering Office for assistance. They may use one or a combination of applicable general work practices, administrative controls, engineering controls, or PPE, such as:

A. General Work Practices/Administrative Controls:

- (1) Anyone working with formaldehyde exposure hazards must maintain current training and education requirements. See section 9.13.
- (2) Handle only the amount of formaldehyde necessary to perform your work.
- (3) Appropriately label all formaldehyde containers with health hazard warnings.
- (4) Store all formaldehyde in closed containers in well ventilated areas. Post signs to remind personnel to replace lids after each use.
- (5) Store and dispense formaldehyde in accordance with applicable fire safety and building code requirements.
- (6) Whenever possible, substitute non-toxic chemicals as an alternative to formaldehyde use to support the Service's goal of using non-toxic chemicals. Contact your Regional Safety Manager or the Division of Safety and Health for assistance.

B. Engineering Controls reduce the potential for exposure hazards by changing the process to reduce or eliminate the hazard through the use of:

- (1) Enclosed-type delivery (e.g., a closed-loop system implemented for delivering formalin when treating adult fish and incubating eggs);
- (2) Exhaust ventilation, such as laboratory fume hoods in sample preservation, preparation, and fish fixing applications; and
- (3) Egg jar systems that are formaldehyde free.

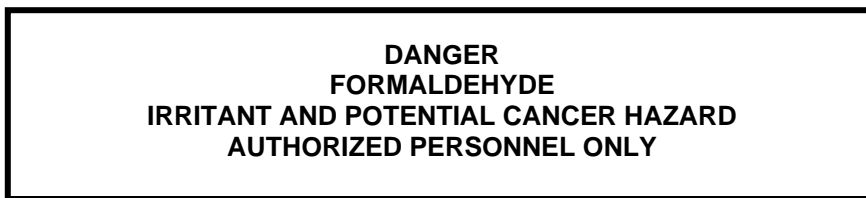
C. PPE and clothing are provided by the Project Leader/Facility Manager/Supervisor, at no cost to the employee, whenever other measures do not eliminate the inhalation exposure hazard to formaldehyde. See section 9.12B for information on:

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- (1) Respiratory protection,
- (2) Protective gloves,
- (3) Eye protection, and
- (4) Other protective equipment.

D. Project Leaders/Facility Managers/Supervisors must:

- (1) Post and maintain signs at all entrances or pathways to **regulated** areas that say:



- (2) Limit access to these areas to those who have received training as described in this chapter.

9.11 When does the Service require medical evaluations for formaldehyde exposure?

A. The Project Leader/Facility Manager/Supervisor must provide access to a medical evaluation by a licensed physician during working hours and at Service expense for:

- (1) All employees exposed to formaldehyde at concentrations at or exceeding the AL or exceeding the STEL,
- (2) An employee experiencing any signs or symptoms of over-exposure to formaldehyde:
 - (a) Human exposure to specific concentrations of formaldehyde may result in a variety of effects from inflammation or irritation of the mouth, throat, and stomach; discoloration, smarting, drying, cracking, of affected skin areas; to difficulty breathing, loss of vision, or death.
 - (b) See Exhibit 1 for information on acute and chronic effects of exposure to formaldehyde.
- (3) An employee working with unknown exposure concentrations (e.g., un-characterized task exposure and emergency conditions), and
- (4) An employee required to wear a respirator while handling formaldehyde (see 242 FW 14).

B. Exhibit 1 provides health hazard information on formaldehyde.

C. When they experience any of the following symptoms (also see 29 CFR 1910.1048(l)(8)), employees must be reassigned to jobs with less or no exposure to formaldehyde until their condition improves:

- (1) Significant irritation of the mucosa of the eyes or of the upper airways,
- (2) Respiratory sensitization,

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- (3) Skin irritation, or
- (4) Skin sensitization attributed to workplace formaldehyde.

9.12 What are the safety equipment requirements for facilities using formaldehyde?

A. The Project Leader/Facility Manager/Supervisor must install eyewashes and emergency showers when required by OSHA 29 CFR 1910.151:

- (1) If the formaldehyde content in the solutions your facility stores or uses is:
 - (a) Equal to or greater than 0.1%, then you must have an eyewash station, and
 - (b) Equal to or greater than 1.0%, you must also have a quick-drench emergency shower.
- (2) Your eyewash stations and emergency showers must meet OSHA requirements and installation must meet the manufacturer's standards. Contact your Regional Safety Manager for guidance.
- (3) Employees must have free, unabated access to eyewashes and showers.
- (4) Personnel must flush plumbed eyewashes and showers on a routine basis, at least once a month, and maintain records of routine flushing. Personnel must not flush portable self-contained-type eyewashes, but instead maintain them in accordance with manufacturer standards.

B. PPE: You must use PPE as part of your safety procedures to prevent over-exposure through inhalation, skin, and eye contact with formaldehyde.

- (1) Unless a JHA demonstrates that other equipment or procedures are sufficient to protect you (see section 9.12B(2) below), you must wear the following PPE to prevent skin and eye contact when handling formaldehyde at any concentration:
 - (a) Nitrile, neoprene, or butyl rubber gloves;
 - (b) Chemical safety goggles;
 - (c) A splash shield; and
 - (d) A lab apron.
- (2) For any operation where a station proposes to use less than full PPE, the Project Leader/Facility Manager/Supervisor must perform a JHA in accordance with Service and OSHA standards and document the procedures and rationale for permitting less than full PPE. You must wear at least the minimum PPE identified in the JHA for that specific operation; otherwise wear the full PPE as described above.
- (3) Whenever the inhalation exposure to formaldehyde remains above the PEL, your Project Leader/Facility Manager/Supervisor will give you a respirator.
 - (a) We require that you are medically qualified, fit-tested, and trained before you can wear a respirator (see 242 FW 14).

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(b) You may ask your supervisor for a respirator to use on a “voluntary use” basis even-though exposure levels do not exceed OSHA’s PEL, STEL, and AL. Ask your Regional Safety Office for assistance on the use of respirators.

9.13 What are the training requirements for employees working with formaldehyde?

A. Project Leaders/Facility Managers/Supervisors must provide training for all employees who are assigned to a workplace where they have exposure to formaldehyde hazards at concentrations greater than or equal to 0.1 ppm. Employees who do not handle formaldehyde, but are in a work environment where formaldehyde is used, must also be trained.

B. Employees must receive training:

- (1)** Before they begin work in an area where formaldehyde is handled,
- (2)** Whenever they are going to use formaldehyde in a new way, and
- (3)** Annually after the initial training.

C. The training must include information on:

- (1)** How to detect the presence or release of formaldehyde;
- (2)** What the health signs and symptoms of over-exposure to formaldehyde are and what the acute and chronic health effects may be (Exhibit 1);
- (3)** What they must do to protect themselves from formaldehyde hazards, including:
 - (a)** Appropriate work practices,
 - (b)** Selection and use of PPE, and
 - (c)** Emergency procedures;
- (4)** The contents of the facility’s Hazard Communication Plan and Chemical Hygiene Plan, if applicable, and where the plans are kept available for their reference;
- (5)** OSHA’s formaldehyde standard (29 CFR 1910.1048); and
- (6)** OSHA’s PEL, AL, and STEL for formaldehyde.

9.14 What are the recordkeeping requirements associated with formaldehyde use?

A. Project Leaders/Facility Managers/Supervisors must retain:

- (1)** A written record of all formaldehyde exposure-related training employees receive (see section 9.13),
- (2)** Exposure sampling results for a minimum of 30 years [29 CFR 1910.1048(o)],
- (3)** Respirator fit testing and medical clearance records until replaced by a more recent record, and

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(4) A written record of routine monthly flushing of eyewashes and emergency showers, and any periodic maintenance performed per manufacturer's standards for portable eyewash units.

B. The servicing Human Capital office must retain all medical evaluations such as physician opinions, physical exam results, physical exam supporting documentation, etc. for, at a minimum, the length of employment plus 30 years. Such documents should be retained in the employee's "Employee Medical Records, SF-66D".

C. We must collect and maintain records containing personal information (e.g., medical evaluations and physician statements, etc.) in compliance with 5 U.S.C. 552a (The Privacy Act of 1974). Employees tasked with storing and maintaining such records must read and be familiar with OPM/GOVT-10. These records:

(1) Are sensitive and protected by The Privacy Act (see 204 FW 1 – 8 for more information on the Privacy Act),

(2) Must only be available to staff on a need-to-know basis,

(3) If electronic, must be password protected and only used in accordance with the routine uses identified in "OPM/GOVT-10, Employee Medical File System Records," and

(4) If hard copy, protected in a locked file and locked room that is available only to staff who have a need to know this information in accordance with OPM/GOVT-10.

/sgd/ Rowan W. Gould
ACTING DIRECTOR

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