

# Great Western Painting

## Arsenic

29 CFR 1910.1018, Inorganic arsenic

29 CFR 1910.1018, App A Inorganic arsenic substance information sheet

29 CFR 1910.1018, App B Substance technical guidelines

29 CFR 1910.1018, App C Medical Surveillance guidelines

### Inorganic arsenic

29 CFR 1010.1018 This program applies to all occupational exposures to inorganic arsenic except that this section does **not apply** to employee exposures in agriculture or resulting from pesticide application, the treatment of wood with preservatives or the utilization of arsenically preserved wood.

Exposures to inorganic arsenic may occur:

1. during the manufacture of insecticides, weed killers and fungicides.
2. during use in the manufacture and handling of calcium arsenate.
3. during use in the manufacture of electrical semiconductors, diodes, and solar batteries.
4. during use as an addition to alloys to increase hardening and heat resistance.
5. during smelting of ores

The health hazard to inorganic arsenic is high. Exposure to airborne concentrations of inorganic arsenic may cause lung cancer, and can be a skin irritant. Inorganic arsenic may also affect your body if swallowed. One compound in particular, arsenic trichloride, is especially dangerous because it can be absorbed readily through the skin. Because inorganic arsenic is a poison, you should wash your hands thoroughly prior to eating or smoking.

Inorganic arsenic definition includes: Copper acetoarsenite, arsenic and all inorganic compounds containing arsenic except arsine, measured as arsenic (As).

The Permissible Exposure Limit [PEL] is: Employee is exposure to inorganic arsenic at concentrations greater than **10 ug/m<sup>3</sup>** of air averaged over any 8-hour period.

Action Level: a concentration of inorganic arsenic of **5 ug/m<sup>3</sup>** of air averaged over any eight (8) hour period.

No employee may be exposed to **any skin or eye contact** with arsenic trichloride or to skin or eye contact likely to cause skin or eye irritation.

**Note: Even though the airborne PEL for arsenic trichloride is 0.01 mg/m<sup>3</sup>, when skin contact occurs, overexposure may occur.**

## Procedures:

The following steps will be taken in the order presented:

The steps to be followed in this program are:

1. Identify types of work where inorganic arsenic exposure may occur, **see above.**
2. Establish, through **exposure monitoring**, that exposures, without respiratory protection, are at or above the **action level for inorganic arsenic which is 5 ug/m<sup>3</sup>** of air averaged over any eight (8) hour period.

**Note: At the above exposure level, a written compliance program will be established and implemented to reduce employee exposure to inorganic arsenic to or below the PEL by means of engineering and work practice controls.**

3. Establish **regulated areas** where the possibility of exposure to inorganic arsenic above the PEL, 10 µg/m<sup>3</sup> of air averaged over an 8 hour time period, is eliminated first through administrative and engineering controls and, if necessary, through the use of PPE.
4. Ensure no employee may work in the regulated areas until they have received **documented training** related to inorganic arsenic exposures, have partaken in a **medical surveillance program**, and demonstrated they are aware of the **engineering controls, the work practice procedures, the plan for emergency situations, and proper use of PPE items.**
5. Establish a **respiratory protection program** addressing specific inorganic arsenic exposures.
6. **Review written procedures annually or more often and update them if significant changes occur.**

## **Exposure Monitoring**

Determinations of airborne exposure levels shall be made from air samples that are representative of each employee's exposure to inorganic arsenic over an eight (8) hour period.

**Note: Employee exposure is that exposure which would occur if the employee were not using a respirator.**

Full shift (for at least 7 continuous hours) personal samples including at least one sample for each shift for each job classification in each work area will be collected.

## Initial Monitoring

Each workplace or work operation where potential exposure to inorganic arsenic exists will be monitored to accurately determine the airborne concentration of inorganic arsenic to which employees may be exposed.

## Frequency

1. If the initial monitoring reveals employee exposure to be below the action level [5 ug/m<sup>3</sup> of air averaged over any eight (8) hour period] the measurements **need not be repeated** unless there has been a production, process, control or personal change which may result in new or additional exposure to inorganic arsenic, or whenever there is reason to suspect a change which may result in new or additional exposures to inorganic arsenic.
2. If the initial monitoring, required by this section, or subsequent monitoring reveals employee exposure to be above the permissible exposure limit [inorganic arsenic at concentrations greater than **10 ug/m<sup>3</sup>** of air averaged over any 8-hour period], monitoring shall be repeated at least quarterly.
3. If the initial monitoring or subsequent monitoring reveals employee exposure to be above the action level and below the permissible exposure limit the employer shall repeat monitoring at least every six months.
4. Continue monitoring at the required frequency will proceed until at least two consecutive measurements, taken at least seven (7) days apart, are below the action level.

Of course, if a production, process, control or personal change which may result in new or additional exposure to inorganic arsenic, then monitoring will continue as above.

## **Notification of Monitoring**

Affected employees will be notified within 15 working days after the receipt of the results of any monitoring b either individually in writing or by posting the results in an appropriate accessible location.

## **Compliance Program**

A written compliance program shall be implemented when the PEL of 10 ug/m(3) is exceeded to reduce exposures to or below the permissible exposure limit by means of engineering and work practice controls.

Written plans for these compliance programs shall include at least the following:

1. A description of each operation in which inorganic arsenic is emitted; e.g. machinery used, material processed, controls in place, crew size, operating procedures and maintenance practices;
2. Engineering plans and studies used to determine methods selected for controlling exposure to inorganic arsenic;
3. A report of the technology considered in meeting the permissible exposure limit;
4. Monitoring data;
5. A detailed schedule for implementation of the engineering controls and work practices that cannot be implemented immediately and for the adaption and implementation of any additional engineering and work practices necessary to meet the permissible exposure limit;
6. Whenever the employer will not achieve the permissible exposure limit with engineering controls and work practices by December 31, 1979, the employer shall include in the compliance plan an analysis of the effectiveness of the various controls, shall install engineering controls and institute work practices on the quickest schedule feasible, and shall include in the compliance plan and implement a program to minimize the discomfort and maximize the effectiveness of respirator use; and
7. Other relevant information.

Written plans for such a program shall be submitted upon request to the Assistant Secretary and the Director, and shall be available at the worksite for examination and copying by the Assistant Secretary, Director, any affected employee or authorized employee representatives.

**The written plan must be reviewed and updated at least annually [more often, if necessary] to reflect the current status of the program.**

### **Training Program**

**A training program will be instituted per 1910.1018(o)(1)(i).**

Each employee who is subject to exposure to inorganic arsenic above the action level without regard to respirator use, or for whom there is the possibility of skin or eye irritation from inorganic arsenic, will be trained and employee participation will be ensured.

The training program for which 1910.1018 applies will be provided will be provided at the time of initial assignment and at least annually for other

covered employees thereafter; and the employer shall assure that each employee is informed of the following:

1. The information contained in **29 CFR 1910.1018, App A Inorganic arsenic substance information sheet**;
2. The quantity, location, manner of use, storage, sources of exposure, and the specific nature of operations which could result in exposure to inorganic arsenic as well as any necessary protective steps;
3. The purpose, proper use, and limitation of respirators;
4. The purpose and a description of the medical surveillance program as required by paragraph (n) of this section;
5. The engineering controls and work practices associated with the employee's job assignment; and
6. A review of 29 CFR 1910.1018.
7. Access to training materials. Specifically, 29 CFR 1910.1018 and its appendices will be made readily available to affected employees.

The employer shall make readily available to all affected employees a copy of this standard and its appendices.

Upon request, all materials relating to the employee information and training program will be provided to the Assistant Secretary and the Director.

### **Regulated Area**

Regulated areas shall be established where worker exposures to inorganic arsenic, without regard to the use of respirators, are in excess of the permissible limit.

Regulated areas shall be demarcated and segregated from the rest of the workplace in any manner that minimizes the number of persons who will be exposed to inorganic arsenic.

Access to regulated areas shall be limited to authorized persons or to persons otherwise authorized by the Act or regulations issued pursuant thereto to enter such areas.

All persons entering a regulated area shall be supplied with a respirator, selected in accordance with the provisions of our Respiratory Protection Program, specifically 29CFR 1910.134(b) through (d) (except (d)(1)(iii)), and (f) through (m).

**Note: If an employee exhibits breathing difficulty during fit testing or respirator use, they must be examined by a physician trained in pulmonary medicine to determine whether they can use a respirator while performing the required duty.**

### Prohibited activities in regulated areas:

Food or beverages are not to be consumed, smoking products, chewing tobacco and gum are not to be used and cosmetics are not to be applied.

**Note: The above may be conducted in the lunchrooms, change rooms and showers.**

**Note: Drinking water may be consumed in the regulated area.**

### Protective Work Clothing and Equipment

Where the possibility of skin or eye irritation from inorganic arsenic exists, and for all workers working in regulated areas, appropriate and clean protective work clothing and equipment shall be provided at no cost to the employee. This clothing and equipment would include, but not be limited to:

1. Coveralls or similar full-body work clothing;
2. Gloves, and shoes or coverlets;
3. Face shields or vented goggles when necessary to prevent eye irritation, which comply with the requirements of 1910.133(a)(2)-(6); and
4. Impervious clothing for employees subject to exposure to arsenic trichloride.

### **Cleaning and replacement.**

The above protective clothing will be provided a freshly laundered and dry condition at least weekly, and daily if the employee works in areas where exposures are over 100 ug/m<sup>3</sup> of inorganic arsenic or in areas where more frequent washing is needed to prevent skin irritation.

The above protective clothing will be cleaned, laundered, or disposed of at no cost to the employee.

The protective clothing and equipment will be repaired or replaced as needed to maintain their effectiveness.

All protective clothing must be removed at the completion of a work shift only in change-rooms.

Contaminated protective clothing which is to be cleaned, laundered, or disposed of, will be placed in a closed container in the change-room which prevents dispersion of inorganic arsenic outside the container.

Any person who cleans or launders clothing, above, will be notified in writing of the potentially harmful effects including the carcinogenic effects of exposure to inorganic arsenic.

## **Labels on contaminated protective clothing and equipment.**

Containers of contaminated protective clothing and equipment in the workplace or which are to be removed from the workplace must be labeled and the labels shall include the following information:

**DANGER: CONTAMINATED WITH INORGANIC ARSENIC. MAY CAUSE CANCER. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF INORGANIC ARSENIC CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE OR FEDERAL REGULATIONS.**

**Note: The removal of inorganic arsenic from protective clothing or equipment by blowing or shaking.**

## **Housekeeping**

1. All surfaces shall be maintained as free as practicable of accumulations of inorganic arsenic.
2. Floors and other accessible surfaces contaminated with inorganic arsenic may not be cleaned by the use of compressed air, and shoveling and brushing may be used only where vacuuming or other relevant methods have been tried and found not to be effective.
3. Where vacuuming methods are selected, the vacuums shall be used and emptied in a manner to minimize the reentry of inorganic arsenic into the workplace.
4. A written housekeeping and maintenance plan shall be kept which shall list appropriate frequencies for carrying out housekeeping operations, and for cleaning and maintaining dust collection equipment. The plan shall be available for inspection by the Assistant Secretary.
5. Periodic cleaning of dust collection and ventilation equipment and checks of their effectiveness shall be carried out to maintain the effectiveness of the system and a notation kept of the last check of effectiveness and cleaning or maintenance.

## **Medical Surveillance**

The employer shall institute A medical surveillance program will be instituted for the following employees:

1. All employees who are or will be exposed above the action level, without regard to the use of respirators, at least 30 days per year; and
2. All employees who have been exposed above the action level, without regard to respirator use, for 30 days or more per year for a

total of 10 years or more of combined employment with the employer or predecessor employers.

3. All medical examinations and procedures will be performed by or under the supervision of a licensed physician, and shall be provided without cost to the employee, without loss of pay and at a reasonable time and place.

The initial medical examination will include at least the following elements:

1. A work history and a medical history which shall include a smoking history and the presence and degree of respiratory symptoms such as breathlessness, cough, sputum production and wheezing.

A medical examination which shall include at least the following:

1. A standard posterior-anterior chest x-ray;
2. A nasal and skin examination; and
3. Other examinations which the physician believes appropriate because of the employees exposure to inorganic arsenic or because of required respirator use.

Periodic examinations.

1. Examinations must be provided at least annually.
2. Whenever a covered employee has not taken the examinations specified above within six (6) months preceding the termination of employment, he/she shall be provided such examinations upon termination of employment.

#### Additional Examinations

If the employee for any reason develops signs or symptoms commonly associated with exposure to inorganic arsenic the employer shall provide an appropriate examination and emergency medical treatment.

The following information shall be provided to the examining physician:

1. A copy of this standard and its appendices;
2. A description of the affected employee's duties as they relate to the employee's exposure;
3. The employee's representative exposure level or anticipated exposure level;
4. A description of any personal protective equipment used or to be used; and
5. Information from previous medical examinations of the affected employee which is not readily available to the examining physician.

## Physician's Written Opinion.

A written opinion from the examining physician provided to our Safety Program Administrator must include:

1. The results of the medical examination and tests performed;
2. The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from exposure to inorganic arsenic;
3. Any recommended limitations upon the employee's exposure to inorganic arsenic or upon the use of protective clothing or equipment such as respirators; and
4. A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further explanation or treatment.

The physician may not to reveal in the written opinion specific findings or diagnoses unrelated to occupational exposure.

A copy of the written opinion shall be provided to the affected employee.

**An accurate record for each employee subject to medical surveillance must be established and maintained.**

- a. This record will include:
  1. the name, social security number, and description of the duties of the employee;
  2. a copy of the physician's written opinions and an explanation sheet for biological monitoring results;
  3. a copy of the medical history, and the results of any physical examination and all test results that are required to be provided by this section, including biological tests, X-rays, pulmonary function tests, etc., or that have been obtained to further evaluate any condition that might be related to inorganic arsenic exposure;
  4. results of any airborne exposure monitoring done on or for that employee and provided to the physician; and
  5. any employee medical complaints related to exposure to inorganic arsenic.
  6. A copy of the information provided to the physician as required by 29 CFR 1910.1018.

## **Recordkeeping**

This program [**our written procedures**] as well as all records required to be maintained by 29 CFR 1910.1027(n), *Recordkeeping*, will be made available, upon request, to affected employees, former employees, and their designated representatives, and to the Assistant Secretary and the Director for examination and copying.

## **Availability of records**

Upon request, the Safety Program Administrator will make any **exposure records** required by 29 CFR 1910.1018, *Inorganic arsenic*, available for examination and copying to affected employees, former employees, designated representatives, and the Assistant Secretary, in accordance with 29 CFR 1910.1020(a) through (e) and (g) through (i).

Upon request, the Safety Program Administrator, will make employee **medical records** required by 29 CFR 1910.1018, *Inorganic arsenic*, available for examination and copying to the subject employee, anyone having the specific written consent of the subject employee, and the Assistant Secretary, in accordance with 29 CFR 1910.1020.

## **Transfer of medical records**

Should we cease to do business, the successor employer shall receive and retain all the above medical records.

Should we cease to do business and there is no successor employer to receive and retain the above medical records, they shall be transmitted to the Director.

At the expiration of the retention period for the above medical records, the Safety Program Administrator will notify the Director at least 3 months prior to the disposal of such records and shall transmit those records to the Director if he requests them within that period.

## **Hygiene Facilities and Practices**

For employees working in regulated areas or subject to the possibility of skin or eye irritation from inorganic arsenic, clean change rooms equipped with storage facilities for street clothes and separate storage facilities for protective clothing and equipment in shall be provided per 29 CFR 1910.141(e).

## **Showers**

The employer shall assure that employees working in regulated areas or subject to the possibility of skin or eye irritation from inorganic arsenic shower at the end of the work shift.

Shower facilities will be provided in accordance with 1910.141(d)(3)(i) through (d)(3)(v).

### Lunchrooms

For employees working in regulated areas, lunchroom facilities which have a temperature controlled, **positive pressure, filtered air supply**, and which are readily accessible to employees working in regulated areas will be provided.

Employees working in the regulated area or subject to the possibility of skin or eye irritation from exposure to inorganic arsenic **must** wash their hands and face prior to eating.

Lavatory facilities which comply with 1910.141(d)(1) and (2) will be provided.

Facilities for employees working in areas where exposure, without regard to the use of respirators, exceeds 100 ug/m<sup>3</sup> will be provided to vacuum their protective clothing and clean or change shoes worn in such areas before entering change rooms, lunchrooms or shower rooms.

Employees **may not allow exposure** to skin or eye contact with arsenic trichloride, or to skin or eye contact with liquid or particulate inorganic arsenic which is likely to cause skin or eye irritation.

### Respiratory Protection

Where engineering and work practice controls are not sufficient to reduce exposures to or below the permissible exposure limit, they shall nonetheless be used to reduce exposures to the lowest levels achievable by these controls and shall be supplemented by the use of respirators.

Respirators must be used during:

1. Periods necessary to install or implement feasible engineering or work-practice controls.
2. Work operations, such as maintenance and repair activities, for which the employer establishes that engineering and work-practice controls are not feasible.
3. Work operations for which engineering and work-practice controls are not yet sufficient to reduce employee exposures to or below the permissible exposure limit.
4. Emergencies.

### Respirator program

Employees will fall under the provisions of our respiratory protection program in accordance with § 1910.134(b) through (d) (except (d)(1)(iii)), and (f) through (m). See Section III of our Safety Program

If an employee exhibits breathing difficulty during fit testing or respirator use, they must be examined by a physician trained in pulmonary medicine to determine whether they can use a respirator while performing the required duty.

### Respirator Selection Special Requirements

Employees **may not use half mask respirators** for protection against arsenic trichloride because it is absorbed rapidly through the skin.

HEPA filters for powered and non-powered air-purifying respirators will be provided.

Appropriate Respirators for Employee Use:

1. Air-purifying respirators that have a combination HEPA filter with an appropriate gas-sorbent cartridge or canister when the employee's exposure exceeds the permissible exposure level for inorganic arsenic and the relevant limit for other gases.
2. Front-or back-mounted gas masks equipped with HEPA filters and acid gas canisters or any full facepiece supplied-air respirators when the inorganic arsenic concentration is at or below 500 mg/m<sup>3</sup>; and half mask air-purifying respirators equipped with HEPA filters and acid gas cartridges when the inorganic arsenic concentration is at or below 100 µg/m<sup>3</sup>.
3. Employees required to use respirators may choose, and the employer must provide, a powered air-purifying respirator if it will provide proper protection. In addition, the employer must provide a combination dust and acid-gas respirator to employees who are exposed to gases over the relevant exposure limits.

PROJECT #: \_\_\_\_\_

**AIR MONITORING REPORT  
INORGANIC ARSENIC PROJECTS**

DATE: \_\_\_\_\_

Air monitoring performed by: \_\_\_\_\_

For: \_\_\_\_\_

SAMPLE I.D.	SAMPLE TYPE	WORKER'S NAME	SOCIAL SECURITY NUMBER	LOCATION	ACTIVITY	RESPIRATOR TYPE

**ANALYTICAL INFORMATION**

SAMPLE I.D.	PUMP NUMBER	CALIB. BEGINNING	FLOW END	RATE (L/min) AVERAGE	START TIME	STOP TIME	DURATION (MINUTES)	VOLUME (Liters)

Comments:

SAMPLE TYPE	ACTIVITY	RESPIRATOR
PRS=personal ENV=environmental HEX=HEPA exhaust	BGD=background CL=clearance FC=final clearance	REM=removal PREP=site prep CLN=clean-up IC=inside cont. BGLD=bag load out OC=outside cont. SA=supplied air

SAMPLED BY: \_\_\_\_\_  
 ANALYZED BY: \_\_\_\_\_  
 REVIEWED BY: \_\_\_\_\_  
 APPROVED BY: \_\_\_\_\_

Note: Sampling media used in 37mm 0.8µ MCE filter unless otherwise noted.