



Oregon Administrative Rules  
Chapter 437

Division 2  
General Occupational Safety and Health

1,2-Dibromo-3-  
Chloropropane

Subdivision

**Z**

Administrative  
Order 3-2019



Pursuant to **Oregon Revised Statutes (ORS) 654**, The Oregon Safe Employment Act (OSEAct), the Oregon Department of Consumer and Business Services, Occupational Safety and Health Division (Oregon OSHA), adopted these rules.

The Secretary of State designated Oregon Administrative Rules Chapter 437 as the Oregon Occupational Safety and Health Division Rules. Six subject areas are designated as “Divisions” of these rules.

- **Division 1** Administration of the Oregon Safe Employment Act
- **Division 2** General Occupational Safety and Health Rules
- **Division 3** Construction
- **Division 4** Agriculture
- **Division 5** Maritime Activities
- **Division 7** Forest Activities

Oregon-initiated rules are numbered in a uniform system developed by the Secretary of State. This system does not number the rules in sequence (001, 002, 003, etc.). Omitted numbers may be assigned to new rules at the time of their adoption.

**Oregon-initiated rules** are arranged in the following codification structure prescribed by the Secretary of State for Oregon Administrative Rules (OAR):

Chapter	Division	Subdivision	Rule	Section	Paragraphs
<i>437</i>	<i>002</i>	<i>N</i>	<i>0221</i>	<i>(1)</i>	<i>(a)(A)(i)(I)</i>

Cite as 437-002-0221(1)(a)

Many of the Oregon OSHA rules are adopted by reference from the Code of Federal Regulations (CFR), and are arranged in the following federal numbering system:

Part	Subpart (Subdivision)	Section	Paragraphs
1910	N	.176	(a)(1)(i)(A)(1)(i)

Cite as 1910.176(a)(1)

The terms “subdivision” and “subpart” are synonymous within OAR 437, Oregon Occupational Safety and Health rules.

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These rules are available for viewing in the Office of the Secretary of State, Oregon State Archives Building, Salem, Oregon.

These rules are available in electronic and printable formats at [osha.oregon.gov](http://osha.oregon.gov).

Printed copies of these rules are available at:

**Department of Consumer & Business Services**  
**Oregon Occupational Safety & Health Division (Oregon OSHA)**  
350 Winter St. NE  
Salem, OR 97301-3882

Or call the Oregon OSHA Resource Library at 503-378-3272.

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**437-002-0360 Adoption by Reference**

*In addition to, and not in lieu of, any other safety and health codes contained in OAR Chapter 437, the Department adopts by reference the following federal regulations printed as part of the Code of Federal Regulations, 29 CFR 1910, in the Federal Register:*

(28) 29 CFR 1910.1044 1,2-dibromo-3-chloropropane, published 5/14/19, FR vol. 84, no. 93, p. 21416.

*These standards are available at the Oregon Occupational Safety and Health Division, Oregon Department of Consumer and Business Services, and the United States Government Printing Office.*

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: APD Admin. Order 13-1988, f. 8/2/88, ef. 8/2/88 (Benzene).  
 APD Admin. Order 14-1988, f. 9/12/88, ef. 9/12/88 (Formaldehyde).  
 APD Admin. Order 18-1988, f. 11/17/88, ef. 11/17/88 (Ethylene Oxide).  
 APD Admin. Order 4-1989, f. 3/31/89, ef. 5/1/89 (Asbestos-Temp).  
 APD Admin. Order 6-1989, f. 4/20/89, ef. 5/1/89 (Non-Asbestiforms-Temp).  
 APD Admin. Order 9-1989, f. 7/7/89, ef. 7/7/89 (Asbestos & Non-Asbestiforms-Perm).  
 APD Admin. Order 11-1989, f. 7/14/89, ef. 8/14/89 (Lead).  
 APD Admin. Order 13-1989, f. 7/17/89, ef. 7/17/89 (Air Contaminants).  
 OR-OSHA Admin. Order 1-1990, f. 1/11/90, ef. 1/11/90 (Formaldehyde-Temp).  
 OR-OSHA Admin. Order 3-1990, f. 1/19/90, ef. 1/19/90 (Asbestos & Non-Asbestiforms-Temp).  
 OR-OSHA Admin. Order 6-1990, f. 3/2/90, ef. 3/2/90 (Formaldehyde-Perm).  
 OR-OSHA Admin. Order 7-1990, f. 3/2/90, ef. 3/2/90 (Asbestos & Non-Asbestiforms-Perm).  
 OR-OSHA Admin. Order 9-1990, f. 5/8/90, ef. 8/8/90 (Labs).  
 OR-OSHA Admin. Order 11-1990, f. 6/7/90, ef. 7/1/90 (Air Contaminants).  
 OR-OSHA Admin. Order 13-1990, f. 6/28/90, ef. 8/1/90 (Asbestos-Temp).  
 OR-OSHA Admin. Order 14-1990, f. 6/28/90, ef. 8/1/90 (Lead).  
 OR-OSHA Admin. Order 19-1990, f. 8/31/90, ef. 8/31/90 (Asbestos-Perm).  
 OR-OSHA Admin. Order 20-1990, f. 9/18/90, ef. 9/18/90 (Lead).  
 OR-OSHA Admin. Order 21-1990, f. 9/18/90, ef. 9/18/90 (Air Contaminants).  
 OR-OSHA Admin. Order 7-1991, f. 4/25/91, ef. 4/25/91 (Air Contaminants, Asbestos, Formaldehyde).  
 OR-OSHA Admin. Order 13-1991, f. 10/10/91, ef. 10/10/91 (Lead, Formaldehyde).  
 OR-OSHA Admin. Order 15-1991, f. 12/13/91, ef. 12/13/91 (Asbestos).  
 OR-OSHA Admin. Order 1-1992, f. 1/22/92, ef. 1/22/92 (Formaldehyde).  
 OR-OSHA Admin. Order 4-1992, f. 4/16/92, ef. 4/16/92 (Formaldehyde).  
 OR-OSHA Admin. Order 5-1992, f. 4/24/92, ef. 7/1/92 (Bloodborne Pathogens).  
 OR-OSHA Admin. Order 6-1992, f. 5/18/92, ef. 5/18/92 (Asbestos).  
 OR-OSHA Admin. Order 10-1992, f. 9/24/92, ef. 9/24/92 (Lead-temp).  
 OR-OSHA Admin. Order 11-1992, f. 10/9/92, ef. 10/9/92 (Asbestos).  
 OR-OSHA Admin. Order 12-1992, f. 10/13/92, ef. 10/13/92 (Formaldehyde).  
 OR-OSHA Admin. Order 15-1992, f. 12/30/92, ef. 12/30/92 (Air Contaminants, BBP, Labs).  
 OR-OSHA Admin. Order 1-1993, f. 1/22/93, ef. 1/22/93 (Cadmium, MDA).  
 OR-OSHA Admin. Order 6-1993, f. 5/17/93, ef. 5/17/93 (Air Contaminants-Temp).  
 OR-OSHA Admin. Order 12-1993, f. 8/20/93, ef. 11/1/93 (remainder of 2/Z).  
 OR-OSHA Admin. Order 17-1993, f. 11/15/93, ef. 11/15/93 (Air Contaminants-Perm).  
 OR-OSHA Admin. Order 4-1995, f. 3/29/95, ef. 3/29/95 (Asbestos).  
 OR-OSHA Admin. Order 8-1995, f. 8/25/95, ef. 8/25/95 (Asbestos).  
 OR-OSHA Admin. Order 4-1996, f. 9/13/96, ef. 9/13/96 (Lead).  
 OR-OSHA Admin. Order 6-1996, f. 11/29/96, ef. 11/29/96 (Asbestos).  
 OR-OSHA Admin. Order 4-1997, f. 4/2/97, ef. 4/2/97.  
 OR-OSHA Admin. Order 6-1997, f. 5/2/97, ef. 5/2/97.  
 OR-OSHA Admin. Order 8-1997, f. 11/14/97, ef. 11/14/97 (Methylene Chloride).  
 OR-OSHA Admin. Order 1-1998, f. 2/13/98, ef. 2/13/98 (Methylene Chloride).  
 OR-OSHA Admin. Order 3-1998, f. 7/7/98, ef. 7/7/98.  
 OR-OSHA Admin. Order 1-1999, f. 3/22/99, ef. 3/22/99.

OR-OSHA Admin. Order 4-1999, f. 4/30/99, ef. 4/30/99.  
OR-OSHA Admin. Order 1-2005, f. 4/12/05, ef. 4/12/05.  
OR-OSHA Admin. Order 4-2006, f. 7/24/06, ef. 7/24/06.  
OR-OSHA Admin. Order 10-2006, f. 11/30/06, ef. 11/30/06.  
OR-OSHA Admin. Order 5-2009, f. 5/29/09, ef. 5/29/09.  
OR-OSHA Admin. Order 4-2011, f. 12/8/11, ef. 12/8/11.  
OR-OSHA Admin. Order 5-2011, f. 12/8/11, ef. 7/1/12.  
OR-OSHA Admin. Order 1-2012, f. 4/10/12, ef. 4/10/12.  
OR-OSHA Admin. Order 5-2012, f. 9/25/12, ef. 9/25/12.  
OR-OSHA Admin. Order 3-2013, f. 7/18/13, ef. 7/18/13.  
OR-OSHA Admin. Order 4-2013, f. 7/19/13, ef. 7/19/13.  
OR-OSHA Admin. Order 3-2019, f. 10/29/19, ef. 10/29/19.

## 1910.1044 1,2-Dibromo-3-Chloropropane.

### (a) Scope and application.

- (1) This section applies to occupational exposure to 1,2-dibromo-3-chloropropane (DBCP).
- (2) This section does not apply to:
  - (i) Exposure to DBCP which results solely from the application and use of DBCP as a pesticide; or
  - (ii) The storage, transportation, distribution or sale of DBCP in intact containers sealed in such a manner as to prevent exposure to DBCP vapors or liquid, except for the requirements of paragraphs (i), (n) and (o) of this section.

### (b) Definitions.

**Assistant Secretary** means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

**Authorized person** means any person required by his duties to be present in regulated areas and authorized to do so by his employer, by this section, or by the Act. "Authorized person" also includes any person entering such areas as a designated representative of employees exercising an opportunity to observe employee exposure monitoring.

**DBCP** means 1,2-dibromo-3-chloropropane, Chemical Abstracts Service Registry Number 96-12-8, and includes all forms of DBCP.

**Director** means the Director, National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee.

**Emergency** means any occurrence such as, but not limited to equipment failure, rupture of containers, or failure of control equipment which may, or does, result in an unexpected release of DBCP.

**OSHA Area Office** means the Area Office of the Occupational Safety and Health Administration having jurisdiction over the geographic area where the affected workplace is located.

(c) Permissible exposure limit.

- (1) Inhalation. The employer shall assure that no employee is exposed to an airborne concentration of DBCP in excess of 1 part DBCP per billion parts of air (ppb) as an 8 hour time-weighted average.
- (2) Dermal and eye exposure. The employer shall assure that no employee is exposed to eye or skin contact with DBCP.

(d) Reserved.

(e) Regulated areas.

- (1) The employer shall establish, within each place of employment, regulated areas wherever DBCP concentrations are in excess of the permissible exposure limit.
- (2) The employer shall limit access to regulated areas to authorized persons.

(f) Exposure monitoring.

(1) General.

- (i) Determinations of airborne exposure levels shall be made from air samples that are representative of each employee's exposure to DBCP over an 8-hour period.
- (ii) For the purposes of this paragraph, employee exposure is that exposure which would occur if the employee were not using a respirator.

(2) Initial. Each employer who has a place of employment in which DBCP is present, shall monitor each workplace and work operation to accurately determine the airborne concentrations of DBCP to which employees may be exposed.

(3) Frequency.

- (i) If the monitoring required by this section reveals employee exposures to be at or below the permissible exposure limit, the employer must repeat these measurements at least every 6 months.

- (ii) If the monitoring required by this section reveals employee exposures to be in excess of the permissible exposure limit, the employer must repeat these measurements for each such employee at least quarterly. The employer must continue quarterly monitoring until at least two consecutive measurements, taken at least seven (7) days apart, are at or below the permissible exposure limit. Thereafter the employer must monitor at least every 6 months.
- (4) Additional. Whenever there has been a production, process, control, or personnel change which may result in any new or additional exposure to DBCP, or whenever the employer has any reason to suspect new or additional exposures to DBCP, the employer shall monitor the employees potentially affected by such change for the purpose of redetermining their exposure.
- (5) Employee notification.
  - (i) The employer must, within 15 working days after the receipt of the results of any monitoring performed under this section, notify each employee of these results either individually in writing or by posting the results in an appropriate location that is accessible to employees.
  - (ii) Whenever the results indicate that employee exposure exceeds the permissible exposure limit, the employer shall include in the written notice a statement that the permissible exposure limit was exceeded and a description of the corrective action being taken to reduce exposure to or below the permissible exposure limit.
- (6) Accuracy of measurement. The employer shall use a method of measurement which has an accuracy, to a confidence level of 95 percent, of not less than plus or minus 25 percent for concentrations of DBCP at or above the permissible exposure limit.
- (g) Methods of compliance.
  - (1) Priority of compliance methods. The employer shall institute engineering and work practice controls to reduce and maintain employee exposures to DBCP at or below the permissible exposure limit, except to the extent that the employer establishes that such controls are not feasible. Where feasible engineering and work practice controls are not sufficient to reduce employee exposures to within the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls, and shall supplement them by use of respiratory protection.
  - (2) Compliance program.



- (i) The employer shall establish and implement a written program to reduce employee exposures to DBCP to or below the permissible exposure limit solely by means of engineering and work practice controls as required by paragraph (g)(1) of this section.
  - (ii) The written program shall include a detailed schedule for development and implementation of the engineering and work practice controls. These plans must be revised at least annually to reflect the current status of the program.
  - (iii) Written plans for these compliance programs 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, the Director, and any affected employee or designated representative of employees.
  - (iv) The employer shall institute and maintain at least the controls described in his most recent written compliance program.
- (h) Respiratory protection.
- (1) General. For employees who are required to use respirators by this section, the employer must provide each employee an appropriate respirator that complies with the requirements of this paragraph. Respirators must be used during:
    - (i) Periods necessary to install or implement feasible engineering and work-practice controls.
    - (ii) Maintenance and repair activities for which engineering and work-practice controls are not feasible.
    - (iii) Work operations for which feasible engineering and work-practice controls are not yet sufficient to reduce employee exposure to or below the permissible exposure limit.
    - (iv) Emergencies.

Oregon OSHA repealed 1910.1044(h)(2). In Oregon, OAR 437-002-1044 applies.

## **437-002-1044 1,2-Dibromo-3-Chloropropane Respiratory Protection Program**

*The employer must implement a respiratory protection program in accordance with Division 2/I, 1910.134(b) through (d) (except (d)(1)(iii)), and (e) through (m) and (o), which covers each employee required by Division 2/Z, 1910.1044 1,2-Dibromo-3-Chloropropane, to use a respirator.*

**Note:** *This is in addition to other respiratory protection and medical surveillance requirements specified in these 1,2-Dibromo-3-Chloropropane rules.*

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 5-2011, f. 12/8/11, ef. 7/1/12.

1910.1044(h)(3) Respirator selection. Employers must:

- (i) Select, and provide to employees, the appropriate atmosphere-supplying respirator specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.
- (ii) Provide employees with one of the following respirator options to use for entry into, or escape from, unknown DBCP concentrations:
  - (A) A combination respirator that includes a supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure or continuous-flow mode, as well as an auxiliary self-contained breathing apparatus (SCBA) operated in a pressure-demand or positive-pressure mode.
  - (B) An SCBA with a full facepiece operated in a pressure-demand or other positive-pressure mode.
- (i) Emergency situations.
  - (1) Written plans.
    - (i) A written plan for emergency situations shall be developed for each workplace in which DBCP is present.
    - (ii) Appropriate portions of the plan shall be implemented in the event of an emergency.
  - (2) Employees engaged in correcting emergency conditions shall be equipped as required in paragraphs (h) and (j) of this section until the emergency is abated.

- (3) Evacuation. Employees not engaged in correcting the emergency shall be removed and restricted from the area and normal operations in the affected area shall not be resumed until the emergency is abated.
- (4) Alerting employees. Where there is a possibility of employee exposure to DBCP due to the occurrence of an emergency, a general alarm shall be installed and maintained to promptly alert employees of such occurrences.
- (5) Medical surveillance. For any employee exposed to DBCP in an emergency situation, the employer shall provide medical surveillance in accordance with paragraph (m)(6) of this section.
- (6) Exposure monitoring.
  - (i) Following an emergency, the employer shall conduct monitoring which complies with paragraph (f) of this section.
  - (ii) In workplaces not normally subject to periodic monitoring, the employer may terminate monitoring when two consecutive measurements indicate exposures below the permissible exposure limit.
- (j) Protective clothing and equipments.
  - (1) Provision and use. Where there is any possibility of eye or dermal contact with liquid or solid DBCP, the employer shall provide, at no cost to the employee, and assure that the employee wears impermeable protective clothing and equipment to protect the area of the body which may come in contact with DBCP. Eye and face protection shall meet the requirements of OAR 437-002-0134(8).
  - (2) Removal and storage.
    - (i) The employer shall assure that employees remove DBCP contaminated work clothing only in change rooms provided in accordance with paragraph (l)(1) of this section.
    - (ii) The employer shall assure that employees promptly remove any protective clothing and equipment which becomes contaminated with DBCP-containing liquids and solids. This clothing shall not be reworn until the DBCP has been removed from the clothing or equipment.
    - (iii) The employer shall assure that no employee takes DBCP contaminated protective devices and work clothing out of the change room, except those employees authorized to do so for the purpose of laundering, maintenance, of disposal.

- (iv) DBCP-contaminated protective devices and work clothing shall be placed and stored in closed containers which prevent dispersion of the DBCP outside the container.
- (v) Containers of DBCP-contaminated protective devices or work clothing which are to be taken out of change rooms or the workplace for cleaning, maintenance or disposal, shall bear labels with the following information:  
CONTAMINATED WITH 1,2-DIBROMO-3-CHLOROPROPANE (DBCP),

MAY CAUSE CANCER

(3) Cleaning and replacement.

- (i) The employer shall clean, launder, repair, or replace protective clothing and equipment required by this paragraph to maintain their effectiveness. The employer shall provide clean protective clothing and equipment at least daily to each affected employee.
- (ii) The employer shall inform any person who launders or clean DBCP-contaminated protective clothing or equipment of the potentially harmful effects of exposure to DBCP.
- (iii) The employer shall prohibit the removal of DBCP from protective clothing and equipment by blowing or shaking.

(k) Housekeeping.

(1) Surfaces.

- (i) All workplace surfaces shall be maintained free of visible accumulations of DBCP.
- (ii) Dry sweeping and the use of compressed air for the cleaning of floors and other surfaces is prohibited where DBCP dusts or liquids are present.
- (iii) Where vacuuming methods are selected to clean floors and other surfaces, either portable units or a permanent system may be used.
  - (A) If a portable unit is selected, the exhaust shall be attached to the general workplace exhaust ventilation system or collected within the vacuum unit, equipped with high efficiency filters or other appropriate means of contaminant removal, so that DBCP is not reintroduced into the workplace air; and
  - (B) Portable vacuum units used to collect DBCP may not be used for other cleaning purposes and shall be labeled as prescribed by paragraph (j)(2)(v) of this section.

- (iv) Cleaning of floors and other surfaces contaminated with DBCP-containing dusts shall not be performed by washing down with a hose, unless a fine spray has first been laid down.
  - (2) Liquids. Where DBCP is present in a liquid form, or as a resultant vapor, all containers or vessels containing DBCP shall be enclosed to the maximum extent feasible and tightly covered when not in use.
  - (3) Waste disposal. DBCP waste scrap, debris, containers or equipment, shall be disposed of in sealed bags or other closed containers which prevent dispersion of DBCP outside the container.
- (l) Hygiene facilities and practices.
- (1) Change rooms. The employer shall provide clean change rooms equipped with storage facilities for street clothes and separate storage facilities for protective clothing and equipment whenever employees are required to wear protective clothing and equipment in accordance with paragraphs (h) and (j) of this section.
  - (2) Showers.
    - (i) The employer shall assure that employees working in the regulated area shower at the end of the work shift.
    - (ii) The employer shall assure that employees whose skin becomes contaminated with DBCP-containing liquids or solids immediately wash or shower to remove any DBCP from the skin.
    - (iii) The employer shall provide shower facilities in accordance with 29 CFR 1910.141(d)(3).
  - (3) Lunchrooms. The employer shall provide lunchroom facilities which have a temperature controlled, positive pressure, filtered air supply, and which are readily accessible to employees working in regulated areas.
  - (4) Lavatories.
    - (i) The employer shall assure that employees working in the regulated area remove protective clothing and wash their hands and face prior to eating.
    - (ii) The employer shall provide a sufficient number of lavatory facilities which comply with 29 CFR 1910.141(d)(1) and (2).
  - (5) Prohibition of activities in regulated areas. The employer shall assure that, in regulated areas, food or beverages are not present or consumed, smoking products and implements are not present or used, and cosmetics are not present or applied.

(m) Medical surveillance.

(1) General.

- (i) The employer shall make available a medical surveillance program for employees who work in regulated areas and employees who are subjected to DBCP exposures in an emergency situation.
- (ii) All medical examinations and procedures shall be performed by or under the supervision of a licensed physician, and shall be provided without cost to the employee.

(2) Frequency and content. At the time of initial assignment, and annually thereafter, the employer shall provide a medical examination for employees who work in regulated areas, which includes at least the following:

- (i) A medical and occupational history including reproductive history.
- (ii) A physical examination, including examination of the genito-urinary tract, testicle size and body habitus, including a determination of sperm count.
- (iii) A serum specimen shall be obtained and the following determinations made by radioimmunoassay techniques utilizing National Institutes of Health (NIH) specific antigen or one of equivalent sensitivity:
  - (A) Serum follicle stimulating hormone (FSH);
  - (B) Serum luteinizing hormone (LH); and
  - (C) Serum total estrogen (females).

(iv) Any other tests deemed appropriate by the examining physician.

(3) Additional examinations. If the employee for any reason develops signs or symptoms commonly associated with exposure to DBCP, the employer shall provide the employee with a medical examination which shall include those elements considered appropriate by the examining physician.

(4) Information provided to the physician. The employer shall provide the following information to the examining physician:

- (i) A copy of this regulation and its appendices;
- (ii) A description of the affected employee's duties as they relate to the employee's exposure;
- (iii) The level of DBCP to which the employee is exposed; and
- (iv) A description of any personal protective equipment used or to be used.

(5) Physician's written opinion.

- (i) For each examination under this section, the employer shall obtain and provide the employee with a written opinion from the examining physician which shall include:
    - (A) The results of the medical tests performed;
    - (B) The physician's opinion as to whether the employee has any detected medical condition which would place the employee at an increased risk of material impairment of health from exposure to DBCP; and
    - (C) Any recommended limitations upon the employee's exposure to DBCP or upon the use of protective clothing and equipment such as respirators.
  - (ii) The employer shall instruct the physician not to reveal in the written opinion specific findings or diagnoses unrelated to occupational exposure.
- (6) Emergency situations. If the employee is exposed to DBCP in an emergency situation, the employer shall provide the employee with a sperm count test as soon as practicable, or, if the employee has been vasectomized or is unable to produce a semen specimen, the hormone tests contained in paragraph (m)(2)(iii) of this section. The employer shall provide these same tests three months later.
- (n) Employee information and training.
- (1) Training program.
    - (i) The employer shall train each employee who may be exposed to DBCP in accordance with the requirements of this section. The employer shall institute a training program and ensure employee participation in the program.
    - (ii) The employer shall assure that each employee is informed of the following:
      - (A) The information contained in Appendix A;
      - (B) The quantity, location, manner of use, release or storage of DBCP and the specific nature of operations which could result in exposure to DBCP as well as any necessary protective steps;
      - (C) The purpose, proper use, and limitations of respirators;
      - (D) The purpose and description of the medical surveillance program required by paragraph (m) of this section; and

(E) A review of this standard, including appendices.

(2) Access to training materials.

- (i) The employer shall make a copy of this standard and its appendices readily available to all affected employees.
- (ii) The employer shall provide, upon request, all materials relating to the employee information and training program to the Assistant Secretary and the Director.

(o) Communication of hazards.

(1) Hazard communication - general.

- (i) Chemical manufacturers, importers, distributors and employers shall comply with all requirements of the Hazard Communication Standard (HCS) (1910.1200) for DBCP.
- (ii) In classifying the hazards of DBCP at least the following hazards are to be addressed: Cancer; reproductive effects; liver effects; kidney effects; central nervous system effects; skin, eye and respiratory tract irritation; and acute toxicity effects.
- (iii) Employers shall include DBCP in the hazard communication program established to comply with the HCS (1910.1200). Employers shall ensure that each employee has access to labels on containers of DBCP and to safety data sheets, and is trained in accordance with the requirements of HCS and paragraph (n) of this section.
- (iv) The employer shall ensure that no statement appears on or near any sign or label required by this paragraph (o) which contradicts or detracts from the meaning of the required sign or label.

(2) Signs.

- (i) The employer shall post signs to clearly indicate all regulated areas. These signs shall bear the legend:

DANGER  
1,2-DIBROMO-3-CHLOROPROPANE  
MAY CAUSE CANCER  
WEAR RESPIRATORY PROTECTION IN THIS AREA  
AUTHORIZED PERSONNEL ONLY



- (ii) Prior to June 1, 2016, employers may use the following legend in lieu of that specified in paragraph (o)(2) of this section:

DANGER

1,2-Dibromo-3-chloropropane

(Insert appropriate trade or common names)

CANCER HAZARD

AUTHORIZED PERSONNEL ONLY

RESPIRATOR REQUIRED

(3) Labels.

- (i) Where DBCP or products containing DBCP are sold, distributed or otherwise leave the employer's workplace bearing appropriate labels required by EPA under the regulations in 40 CFR Part 162, the labels required by this paragraph (o)(3) need not be affixed.
- (ii) The employer shall ensure that the precautionary labels required by this paragraph (o)(3) are readily visible and legible.
- (iii) Prior to June 1, 2015, employers may include the following information on containers of DBCP or products containing DBCP, DBCP-contaminated protective devices or work clothing or DBCP-contaminated portable vacuums in lieu of the labeling requirements in paragraphs (j)(2)(v), (k)(l)(iii)(b) and (o)(1)(i) of this section:

DANGER

1,2-Dibromo-3-chloropropane

CANCER HAZARD

(p) Recordkeeping.

(1) Exposure monitoring.

- (i) The employer shall establish and maintain an accurate record of all monitoring required by paragraph (f) of this section.
- (ii) This record shall include:
- (A) The dates, number, duration and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure;
- (B) A description of the sampling and analytical methods used;

- (C) Type of respiratory protective devices worn, if any; and
  - (D) Name and job classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent.
- (iii) The employer shall maintain this record for at least 40 years or the duration of employment plus 20 years, whichever is longer.
- (2) Medical surveillance.
- (i) The employer shall establish and maintain an accurate record for each employee subject to medical surveillance required by paragraph (m) of this section.
  - (ii) This record shall include:
    - (A) The name of the employee;
    - (B) A copy of the physician's written opinion;
    - (C) Any employee medical complaints related to exposure to DBCP;
    - (D) A copy of the information provided the physician as required by paragraphs (m)(4)(ii) through (m)(4)(iv) of this section; and
    - (E) A copy of the employee's medical and work history.
  - (iii) The employer shall maintain this record for at least 40 years or the duration of employment plus 20 years, whichever is longer.
- (3) Availability.
- (i) The employer shall assure that all records required to be maintained by this section be made available upon request to the Assistant Secretary and the Director for examination and copying.
  - (ii) Employee exposure monitoring records and employee medical records required by this paragraph shall be provided upon request to employees, designated representatives, and the Assistant Secretary in accordance with 29 CFR 1910.1020(a) through (e) and (g) through (i).
- (4) Transfer of records.
- (i) If the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by paragraph (p) of this section for the prescribed period.
  - (ii) The employer shall also comply with any additional requirements involving transfer of records set forth in 29 CFR 1910.1020(h).

(q) Observation of monitoring.

- (1) Employee observation. The employer shall provide affected employees, or their designated representatives, with an opportunity to observe any monitoring of employee exposure to DBCP required by this section.
- (2) Observation procedures.
  - (i) Whenever observation of the measuring or monitoring of employee exposure to DBCP requires entry into an area where the use of protective clothing or equipment is required, the employer shall provide the observer with personal protective clothing or equipment required to be worn by employees working in the area, assure the use of such clothing and equipment, and require the observer to comply with all other applicable safety and health procedures.
  - (ii) Without interfering with the monitoring or measurement, observers shall be entitled to:
    - (A) Receive an explanation of the measurement procedures;
    - (B) Observe all steps related to the measurement of airborne concentrations of DBCP performed at the place of exposure; and
    - (C) Record the results obtained.

(r) Appendices. The information contained in the appendices is not intended, by itself, to create any additional obligations not otherwise imposed or to detract from any existing obligation.

[43 FR 27394, June 23, 1978; 43 FR 35035, Aug. 8, 1978, as amended at 45 FR 67340, Oct. 10, 1980; 50 FR 51173, Dec. 13, 1985; 51 FR 24325, July 3, 1986; 54 FR 24334, June 7, 1989; 61 FR 5508, Feb. 13, 1996; 63 FR 1290, Jan. 8, 1998; 65 FR 76567, Dec. 7, 2000; 70 FR 1142, Jan. 5, 2005; 71 FR 16672, 16673, Apr. 3, 2006; 71 FR 50189, Aug. 24, 2006; 73 FR 75586, Dec. 12, 2008; 76 FR 33609, June 8, 2011; 77 FR 17782, Mar. 26, 2012; 84 FR 21416, May 14, 2019.]

Stat. Auth: ORS 654.025(2) and 656.726(4)

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 12-1993, f. 8/20/93, ef. 11/1/93.  
OR-OSHA Admin. Order 3-1998, f. 7/7/98, ef. 7/7/98.  
OR-OSHA Admin. Order 1-2005, f. 4/12/05, ef. 4/12/05.  
OR-OSHA Admin. Order 4-2006, f. 7/24/06, ef. 7/24/06.  
OR-OSHA Admin. Order 10-2006, f. 11/30/06, ef. 11/30/06.  
OR-OSHA Admin. Order 5-2009, f. 5/29/09, ef. 5/29/09.  
OR-OSHA Admin. Order 4-2011, f. 12/8/11, ef. 12/8/11.  
OR-OSHA Admin. Order 5-2011, f. 12/8/11, ef. 7/1/12.  
OR-OSHA Admin. Order 1-2012, f. 4/10/12, ef. 4/10/12.  
OR-OSHA Admin. Order 5-2012, f. 9/25/12, ef. 9/25/12.  
OR-OSHA Admin. Order 3-2019, f. 10/29/19, ef. 10/29/19.



## Appendix A to 1910.1044 – Substance Safety Data Sheet for DBCP

### I. Substance Identification

A. Synonyms and trades names: DBCP; Dibromochloropropane; Fumazone (Dow Chemical Company TM); Nemaflume; Nemagon (Shell Chemical Co. TM); Nemaset; BBC 12; and OS 1879.

B. Permissible exposure:

1. Airborne. 1 part DBCP vapor per billion parts of air (1 ppb); time-weighted average (TWA) for an 8-hour workday.
2. Dermal. Eye contact and skin contact with DBCP are prohibited.

C. Appearance and odor: Technical grade DBCP is a dense yellow or amber liquid with a pungent odor. It may also appear in granular form, or blended in varying concentrations with other liquids.

D. Uses: DBCP is used to control nematodes, very small worm-like plant parasites, on crops including cotton, soybeans, fruits, nuts, vegetables and ornamentals.

### II. Health Hazard Data

A. Routes of entry: Employees may be exposed:

1. Through inhalation (breathing);
2. Through ingestion (swallowing);
3. Skin contact; and
4. Eye contact.

B. Effects of exposure:

1. Acute exposure. DBCP may cause drowsiness, irritation of the eyes, nose, throat and skin, nausea and vomiting. In addition, overexposure may cause damage to the lungs, liver or kidneys.
2. Chronic exposure. Prolonged or repeated exposure to DBCP has been shown to cause sterility in humans. It also has been shown to produce cancer and sterility in laboratory animals and has been determined to constitute an increased risk of cancer in man.
3. Reporting Signs and Symptoms. If you develop any of the above signs or symptoms that you think are caused by exposure to DBCP, you should inform your employer.

### III. Emergency First Aid Procedures

- A. Eye exposure. If DBCP liquid or dust containing DBCP gets into your eyes, wash your eyes immediately with large amounts of water, lifting the lower and upper lids occasionally. Get medical attention immediately. Contact lenses should not be worn when working with DBCP.
- B. Skin exposure. If DBCP liquids or dusts containing DBCP get on your skin, immediately wash using soap or mild detergent and water. If DBCP liquids or dusts containing DBCP penetrate through your clothing, remove the clothing immediately and wash. If irritation is present after washing get medical attention.
- C. Breathing. If you or any person breathe in large amounts of DBCP, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Do not use mouth-to-mouth. Keep the affected person warm and at rest. Get medical attention as soon as possible.
- D. Swallowing. When DBCP has been swallowed and the person is conscious, give the person large amounts of water immediately. After the water has been swallowed, try to get the person to vomit by having him touch the back of his throat with his finger. Do not make an unconscious person vomit. Get medical attention immediately.
- E. Rescue. Notify someone. Put into effect the established emergency rescue procedures. Know the locations of the emergency rescue equipment before the need arises.

### IV. Respirators and Protective Clothing

- A. Respirators. You may be required to wear a respirator in emergencies and while your employer is in the process of reducing DBCP exposures through engineering controls. If respirators are worn, they must have a National Institute for Occupational Safety and Health (NIOSH) approval label (Older respirators may have a Bureau of Mines Approval label). For effective protection, a respirator must fit your face and head snugly. The respirator should not be loosened or removed in work situations where its use is required. DBCP does not have a detectable odor except at 1,000 times or more above the permissible exposure limit. If you can smell DBCP while wearing a respirator, the respirator is not working correctly; go immediately to fresh air. If you experience difficulty breathing while wearing a respirator, tell your employer.

- B. Protective clothing. When working with DBCP you must wear for your protection impermeable work clothing provided by your employer. (Standard rubber and neoprene protective clothing do not offer adequate protection).
- DBCPC must never be allowed to remain on the skin. Clothing and shoes must not be allowed to become contaminated with DBCP, and if they do, they must be promptly removed and not worn again until completely free of DBCP. Turn in impermeable clothing that has developed leaks for repair or replacement.
- C. Eye protection. You must wear splash-proof safety goggles where there is any possibility of DBCP liquid or dust contacting your eyes.
- V. Precautions for Safe Use, Handling, and Storage
- A. DBCP must be stored in tightly closed containers in a cool, well-ventilated area.
- B. If your work clothing may have become contaminated with DBCP, or liquids or dusts containing DBCP, you must change into uncontaminated clothing before leaving the work premises.
- C. You must promptly remove any protective clothing that becomes contaminated with DBCP. This clothing must not be reworn until the DBCP is removed from the clothing.
- D. If your skin becomes contaminated with DBCP, you must immediately and thoroughly wash or shower with soap or mild detergent and water to remove any DBCP from your skin.
- E. You must not keep food, beverages, cosmetics, or smoking materials, nor eat or smoke, in regulated areas.
- F. If you work in a regulated area, you must wash your hands thoroughly with soap or mild detergent and water, before eating, smoking or using toilet facilities.
- G. If you work in a regulated area, you must remove any protective equipment or clothing before leaving the regulated area.
- H. Ask your supervisor where DBCP is used in your work area and for any additional safety and health rules.
- VI. Access to Information
- A. Each year, your employer is required to inform you of the information contained in this Substance Safety Data Sheet for DBCP. In addition, your employer must instruct you in the safe use of DBCP, emergency procedures, and the correct use of protective equipment.

- B. Your employer is required to determine whether you are being exposed to DBCP. You or your representative have the right to observe employee exposure measurements and to record the result obtained. Your employer is required to inform you of your exposure. If your employer determines that you are being overexposed, he is required to inform you of the actions which are being taken to reduce your exposure.
- C. Your employer is required to keep records of your exposure and medical examinations. Your employer is required to keep exposure and medical data for at least 40 years or the duration of your employment plus 20 years, whichever is longer.
- D. Your employer is required to release exposure and medical records to you, your physician, or other individual designated by you upon your written request.

Stat. Auth: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 12-1993, f. 8/20/93, ef. 11/1/93.



**Appendix B to 1910.1044 – Substance Technical Guidelines for DBCP****I. Physical and Chemical Data****A. Substance Identification**

1. Synonyms: 1,2-dibromo-3-chloropropane; DBCP, Fumazone; Nemaforme; Nemagon; Nemaset; BBC 12; OS 1879. DBCP is also included in agricultural pesticides and fumigants which include the phrase “Nema---” in their name.
2. Formula:  $C_3H_5Br_2Cl$ .
3. Molecular Weight: 236.

**B. Physical Data:**

1. Boiling point (760 mm HG): 195° C (383° F)
2. Specific gravity (water = 1): 2.093.
3. Vapor density (air = 1 at boiling point of DBCP): Data not available.
4. Melting point: 6° C (43° F).
5. Vapor pressure at 20° C (68° F): 0.8 mm Hg
6. Solubility in water: 1000 ppm.
7. Evaporation rate (Butyl Acetate = 1): very much less than 1.
8. Appearance and odor: Dense yellow or amber liquid with a pungent odor at high concentrations. Any detectable odor of DBCP indicates overexposure.

**II. Fire Explosion and Reactivity Hazard Data****A. Fire**

1. Flash point: 170° F (77° C)
2. Autoignition temperature: Data not available.
3. Flammable limits in air, percent by volume: Data not available.
4. Extinguishing media: Carbon dioxide, dry chemical.
5. Special fire-fighting procedures: Do not use a solid stream of water since a stream will scatter and spread the fire. Use water spray to cool containers exposed to a fire.
6. Unusual fire and explosion hazards: None known.

7. For purposes of complying with the requirements of 1910.106, liquid DBCP is classified as a Category 4 flammable liquid.
8. For the purpose of complying with 1910.309, the classification of hazardous locations as described in article 500 of the National Electrical Code for DBCP shall be Class I, Group D.
9. For the purpose of compliance with 1910.157, DBCP is classified as a Class B fire hazard.
10. For the purpose of compliance with 1910.178, locations classified as hazardous locations due to the presence of DBCP shall be Class I, Group D.
11. Sources of ignition are prohibited where DBCP presents a fire or explosion hazard.

#### B. Reactivity

1. Conditions contributing to instability: None known.
2. Incompatibilities: Reacts with chemically active metals, such as aluminum, magnesium and tin alloys.
3. Hazardous decomposition products: Toxic gases and vapors (such as HBr, HCl and carbon monoxide) may be released in a fire involving DBCP.
4. Special precautions: DBCP will attack some rubber materials and coatings.

#### III. Spill, Leak and Disposal Procedures

##### A. If DBCP is spilled or leaked, the following steps should be taken:

1. The area should be evacuated at once and re-entered only after thorough ventilation.
2. Ventilate area of spill or leak.
3. If in liquid form, collect for reclamation or absorb in paper, vermiculite, dry sand, earth or similar material.
4. If in solid form, collect spilled material in the most convenient and safe manner for reclamation or for disposal.

##### B. Persons not wearing protective equipment must be restricted from areas of spills or leaks until cleanup has been completed.

##### C. Waste Disposal Methods:

1. For small quantities of liquid DBCP, absorb on paper towels, remove to a safe place (such as a fume hood) and burn the paper. Large quantities can be reclaimed or collected and atomized in a suitable combustion chamber equipped with an appropriate effluent gas cleaning device. If liquid DBCP is absorbed in vermiculite, dry sand, earth or similar material and placed in sealed containers it may be disposed of in a State-approved sanitary landfill.
2. If in solid form, for small quantities, place on paper towels, remove to a safe place (such as a fume hood) and burn. Large quantities may be reclaimed. However, if this is not practical, dissolve in a flammable solvent (such as alcohol) and atomize in a suitable combustion chamber equipped with an appropriate effluent gas cleaning device. DBCP in solid form may also be disposed in a state-approved sanitary landfill.

#### IV. Monitoring and Measurement Procedures

##### A. Exposure above the permissible exposure limit.

1. Eight Hour Exposure Evaluation: Measurements taken for the purpose of determining employee exposure under this section are best taken so that the average 8-hour exposure may be determined from a single 8-hour sample or two (2) 4 hour samples. Air samples should be taken in the employee's breathing zone (air that would most nearly represent that inhaled by the employee).
2. Monitoring Techniques: The sampling and analysis under this section may be performed by collecting the DBCP vapor on petroleum based charcoal absorption tubes with subsequent chemical analyses. The method of measurement chosen should determine the concentration of airborne DBCP at the permissible exposure limit to an accuracy of plus or minus 25 percent. If charcoal tubes are used, a total volume of 10 liters should be collected at a flow rate of 50 cc. per minute for each tube. Analyze the resultant samples as you would samples of halogenated solvent.

- B. Since many of the duties relating to employee protection are dependent on the results of monitoring and measuring procedures, employers should assure that the evaluation of employee exposures is performed by a competent industrial hygienist or other technically qualified person.

#### V. Protective Clothing

Employees should be required to wear appropriate protective clothing to prevent any possibility of skin contact with DBCP. Because DBCP is absorbed through the skin, it is important to prevent skin contact with both liquid and solid forms of DBCP. Protective clothing should include impermeable coveralls or similar fullbody work clothing, gloves, headcoverings, and workshoes or shoe coverings. Standard rubber and neoprene gloves do not offer adequate protection and should not be relied upon to keep DBCP off the skin. DBCP should never be allowed to remain on the skin. Clothing and shoes should not be allowed to become contaminated with the material, and if they do, they should be promptly removed and not worn again until completely free of the material. Any protective clothing which has developed leaks or is otherwise found to be defective should be repaired or replaced. Employees should also be required to wear splash-proof safety goggles where there is any possibility of DBCP contacting the eyes.

#### VI. Housekeeping and Hygiene Facilities

1. The workplace must be kept clean, orderly and in a sanitary condition;
2. Dry sweeping and the use of compressed air is unsafe for the cleaning of floors and other surfaces where DBCP dust or liquids are found. To minimize the contamination of air with dust, vacuuming with either portable or permanent systems must be used. If a portable unit is selected, the exhaust must be attached to the general workplace exhaust ventilation system, or collected within the vacuum unit equipped with high efficiency filters or other appropriate means of contamination removal and not used for other purposes. Units used to collect DBCP must be labeled.
3. Adequate washing facilities with hot and cold water must be provided, and maintained in a sanitary condition. Suitable cleansing agents should also be provided to assure the effective removal of DBCP from the skin.
4. Change or dressing rooms with individual clothes storage facilities must be provided to prevent the contamination of street clothes with DBCP. Because of the hazardous nature of DBCP, contaminated protective clothing must be stored in closed containers for cleaning or disposal.

#### VII. Miscellaneous Precautions

- A. Store DBCP in tightly closed containers in a cool, well ventilated area.
- B. Use of supplied-air suits or other impervious clothing (such as acid suits) may be necessary to prevent skin contact with DBCP. Supplied-air suits should be selected, used, and maintained under the supervision of persons knowledgeable in the limitations and potential life-endangering characteristics of supplied-air suits.

C. The use of air-conditioned suits may be necessary in warmer climates.

D. Advise employees of all areas and operations where exposure to DBCP could occur.

#### VIII. Common Operations

Common operations in which exposure to DBCP is likely to occur are: during its production; and during its formulation into pesticides and fumigants.

Stat. Auth: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 12-1993, f. 8/20/93, ef. 11/1/93.



## Appendix C to 1910.1044 – Medical Surveillance Guidelines for DBCP

### I. Route of Entry

Inhalation; skin absorption

### II. Toxicology

Recent data collected on workers involved in the manufacture and formulation of DBCP has shown that DBCP can cause sterility at very low levels of exposure. This finding is supported by studies showing that DBCP causes sterility in animals. Chronic exposure to DBCP resulted in pronounced necrotic action on the parenchymatous organs (i.e., liver, kidney, spleen) and on the testicles of rats at concentrations as low as 5 ppm. Rats that were chronically exposed to DBCP also showed changes in the composition of the blood, showing low RBC, hemoglobin, and WBC, and high reticulocyte levels as well as functional hepatic disturbance, manifesting itself in a long prothrombin time. Reznik et al. noted a single dose of 100 mg produced profound depression of the nervous system of rats. Their condition gradually improved. Acute exposure also resulted in the destruction of the sex gland activity of male rats as well as causing changes in the estrous cycle in female rats. Animal studies have also associated DBCP with an increased incidence of carcinoma. Olson, et al. orally administered DBCP to rats and mice 5 times per week at experimentally predetermined maximally tolerated doses and at half those doses. As early as ten weeks after initiation of treatment, DBCP induced a high incidence of squamous cell carcinomas of the stomach with metastases in both species. DBCP also induced mammary adenocarcinomas in the female rats at both dose levels.

### III. Signs and Symptoms

- A. Inhalation: Nausea, eye irritation, conjunctivitis, respiratory irritation, pulmonary congestion or edema, CNS depression with apathy, sluggishness, and ataxia.
- B. Dermal: Erythema or inflammation and dermatitis on repeated exposure.

### IV. Special Tests

- A. Semen analysis: The following information excerpted from the document “Evaluation of Testicular Function”, submitted by the Corporate Medical Department of the Shell Oil Company (exhibit 39-3), may be useful to physicians conducting the medical surveillance program;

In performing semen analyses certain minimal but specific criteria should be met:

1. It is recommended that a minimum of three valid semen analyses be obtained in order to make a determination of an individual's average sperm count.
2. A period of sexual abstinence is necessary prior to the collection of each masturbatory sample. It is recommended that intercourse or masturbation be performed 48 hours before the actual specimen collection. A period of 48 hours of abstinence would follow; then the masturbatory sample would be collected.
3. Each semen specimen should be collected in a clean, widemouthed, glass jar (not necessarily pre-sterilized) in a manner designated by the examining physician. Any part of the seminal fluid exam should be initialed only after liquifaction is complete, i.e., 30 to 45 minutes after collection.
4. Semen volume should be measured to the nearest 1/10 of a cubic centimeter.
5. Sperm density should be determined using routine techniques involving the use of a white cell pipette and a hemocytometer chamber. The immobilizing fluid most effective and most easily obtained for this process is distilled water.
6. Thin, dry smears of the semen should be made for a morphologic classification of the sperm forms and should be stained with either hematoxylin or the more difficult, yet more precise, Papanicolaou technique. Also of importance to record is obvious sperm agglutination, pyospermia, delayed liquifaction (greater than 30 minutes), and hyperviscosity. In addition, pH, using nitrazine paper, should be determined.
7. A total morphology evaluation should include percentages of the following:
  - a. Normal (oval) forms,
  - b. Tapered forms,
  - c. Amorphous forms (include large and small sperm shapes),
  - d. Duplicated (either heads or tails) forms, and
  - e. Immature forms.



8. Each sample should be evaluated for sperm viability (percent viable sperm moving at the time of examination) as well as sperm motility (subjective characterization of “purposeful forward sperm progression” of the majority of those viable sperm analyzed) within two hours after collection, ideally by the same or equally qualified examiner.

B. Serum determinations: The following serum determinations should be performed by radioimmunoassay techniques using National Institutes of Health (NIH) specific antigen or antigen preparations of equivalent sensitivity:

1. Serum follicle stimulating hormone (FSH);
2. Serum luteinizing hormone (LH); and
3. Serum total estrogen (females only).

#### V. Treatment

Remove from exposure immediately, give oxygen or artificial resuscitation if indicated. Contaminated clothing and shoes should be removed immediately. Flush eyes and wash contaminated skin. If swallowed and the person is conscious, induce vomiting. Recovery from mild exposures is usually rapid and complete.

#### VI. Surveillance and Preventive Considerations

- A. Other considerations. DBCP can cause both acute and chronic effects. It is important that the physician become familiar with the operating conditions in which exposure to DBCP occurs. Those with respiratory disorders may not tolerate the wearing of negative pressure respirators.
- B. Surveillance and screening. Medical histories and laboratory examinations are required for each employee subject to exposure to DBCP. The employer should screen employees for history of certain medical conditions (listed below) which might place the employee at increased risk from exposure.
1. Liver disease. The primary site of biotransformation and detoxification of DBCP is the liver. Liver dysfunctions likely to inhibit the conjugation reactions will tend to promote the toxic actions of DBCP. These precautions should be considered before exposing persons with impaired liver function to DBCP.
  2. Renal disease. Because DBCP has been associated with injury to the kidney it is important that special consideration be given to those with possible impairment of renal function.

3. Skin disease. DBCP can penetrate the skin and can cause erythema on prolonged exposure. Persons with pre-existing skin disorders may be more susceptible to the effects of DBCP.
4. Blood dyscrasias. DBCP has been shown to decrease the content of erythrocytes, hemoglobin, and leukocytes in the blood, as well as increase the prothrombin time. Persons with existing blood disorders may be more susceptible to the effects of DBCP.
5. Reproductive disorders. Animal studies have associated DBCP with various effects on the reproductive organs. Among these effects are atrophy of the testicles and changes in the estrous cycle. Persons with pre-existing reproductive disorders may be at increased risk to these effects of DBCP.

## References

1. Reznik, Ya. B. and Sprinchan, G. K.: Experimental Data on the Gonadotoxic effect of Nemagon, *Gig. Sanit.*, (6), 1975, pp. 101-102, (translated from Russian).
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[43 FR 11527, Mar. 17, 1978, as amended at 45 FR 35283, May 23, 1980; 49 FR 18295, Apr. 30, 1984; 54 FR 24334, June 7, 1989; 58 FR 35310, June 30, 1993; 61 FR 5508, Feb. 13, 1996; 63 FR 1291, Jan. 8, 1998]

Stat. Auth: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 12-1993, f. 8/20/93, ef. 11/1/93.

## Historical Notes for Subdivision Z

**Note:** Effective 11/1/93, Oregon OSHA has adopted by reference the remainder of the federal standards in Division 2/Z, Toxic and Hazardous Substances. This adoption replaces seven Oregon codes which are essentially identical to federal standards with the same titles. However, Oregon's former Division 116, Carcinogens, which had groups these substances in one code, has been replaced by 16 separate federal standards for the individual carcinogens. One carcinogen not regulated by federal OSHA is MOCA. In Oregon, MOCA has been regulated since 1975. Therefore, Oregon OSHA will continue this regulation with Oregon-initiated rule 437-02-364. Oregon OSHA has also retained and renumbered rules from Division 116 which regulate the use of carcinogenic substances used in laboratory activities as OAR 437-02-391. Other Oregon rules which have been retained and renumbered are for Hazard Communication, pertaining to agriculture and subpoenas (437-02-377). Two Oregon codes will be retained in their entirety, renumbered, and redesignated as part of Division 2/Z. These are Division 130 (Thiram) and Division 153, Pipe Labelling. Two other Oregon codes have been repealed because they are no longer necessary. These are Division 140, Fumigation (of bedding), and Division 3-005, Railroad Sanitation and Drinking Water Facilities (PUC has jurisdiction over railroad employees).

This is Oregon OSHA Administrative Order 12-1993, filed August 20, 1993, effective November 1, 1993.

**Note:** Federal OSHA published in the Federal Register the new respiratory protection standard. The new standard replaces respiratory protection standards that were adopted in 1971 by OSHA. The new respiratory protection text is in general industry, 29 CFR 1910.134. The text previously in 1910.134 has been redesignated as 1910.139, respiratory protection for M. tuberculosis. Four subdivisions in the construction standard have also been amended.

This new standard requires employers to establish or maintain a respiratory protection program to protect workers that wear respirators. Other provisions include requirements for program administration; work site-specific procedures; respirator selection; employee training; fit testing; medical evaluation; respirator use; and respirator cleaning, maintenance, and repair. Addressed for the first time are atmospheres that are immediately dangerous to life or health, including interior structural firefighting. The standard also simplifies and updates previous respiratory protection requirements.

This is Oregon OSHA Administrative Order 3-1998, filed and effective July 2, 1998.

**Note:** Oregon OSHA adopted federal OSHA amendments to the standard for occupational exposure to cotton dust, as published in the December 7, 2000 Federal Register. The amendment adds one additional method of washing cotton to the methods the rule already permits employers to use to achieve partial exemption from the cotton dust standard, 1910.1043. In Oregon, the cotton dust standard is in general industry, Division 2/Z, Toxic and Hazardous Substances. The paragraph amended is 1910.1043(n)(4).

This is Oregon OSHA Administrative Order 6-2001, filed and effective May 15, 2001.

**Note:** Federal OSHA published in the January 5, 2005 Federal Register amendments to remove and revise provisions of its standards that are outdated, duplicative, unnecessary, or inconsistent, or can be clarified or simplified by being written in plain language. Most of these changes are in the health standards in general industry, construction, and shipyard employment. The December 6, 2004 Federal Register, makes a correction to a cross reference in Methylenedianiline in construction. We also repealed an Oregon-initiated rule that has effective dates that have passed a number of years ago and is no longer necessary. A non-mandatory appendix to OAR 437-002-0161, Medical and First Aid, was added. Oregon OSHA adopted all these changes to remain at least as effective as federal OSHA standards.

This is Oregon OSHA Administrative Order 1-2005, filed and effective April 12, 2005.

**Note:** Oregon OSHA adopted federal OSHA changes as they appear in the April 3, 2006 Federal Register. These revisions include updating references and removing obsolete effective dates and startup dates from existing rules in general industry, construction, and maritime activities. Two changes federal OSHA made that we do not include in this rulemaking are to remove effective dates in 1910.266 and 1926.1092, neither of which Oregon OSHA had adopted before.

This is Oregon OSHA Administrative Order 4-2006, filed and effective July 24, 2006.

**Note:** Oregon OSHA adopts the Federal OSHA changes as they appear in the August 24, 2006 Federal Register. These changes revise the existing rules on respiratory protection, adding definitions and new language that establishes assigned protection factors (APFs) and maximum use concentrations (MUCs) for respirator use. The revisions also supersede the respirator selection provisions of existing substance-specific standards with these new APFs (except for the respirator selection provisions of the 1, 3-Butadiene Standard).

Federal OSHA developed the final APFs after thoroughly reviewing the available literature, including chamber-simulation studies and workplace protection factor studies, comments submitted to the records, and hearing testimony. The final APFs provide employers with critical information to use when selecting respirators for employees exposed to atmospheric contaminants found in general industry, construction, shipyards, longshoring, and marine terminal workplaces. Oregon OSHA also adopted these changes into Division 4, Agriculture. Proper respirator selection using APFs is an important component of an effective respiratory protection program. Accordingly, federal OSHA concludes that the final APFs are necessary to protect employees who must use respirators to protect them from airborne contaminants.

This is Oregon OSHA Administrative Order 10-2006, filed and effective November 30, 2006.

**Note:** In this rulemaking, Oregon OSHA is amending its standards to add language clarifying that the personal protective equipment (PPE) and training requirements impose a compliance duty to each and every employee covered by the standards and that noncompliance may expose the employer to liability on a per-employee basis. The amendments consist of new paragraphs added to the introductory sections of the affected rules and changes to the language of some existing respirator and training requirements.

These federal OSHA changes are in general industry, construction, and maritime, and were published in the December 12, 2008 Federal Register.

This is Oregon OSHA Administrative Order 5-2009, filed and effective May 29, 2009.

**Note:** Oregon OSHA adopted changes to rules in general industry, construction, agriculture, and maritime. Federal OSHA published a number of rule changes in these industries in the June 8, 2011 Federal Register. This is Phase III of the Standards Improvement Project (SIP III), the third in a series of rulemaking by federal OSHA to improve and streamline the standards. This removes or revises individual requirements within rules that are confusing, outdated, duplicative, or inconsistent. Oregon OSHA adopted the majority of the federal changes that include: - personal protective equipment- remove requirements that employers prepare and maintain written training certification records. - Respiratory protection- revise requirements for breathing-gas containers. -Material handling/Slings- revise standards in general industry, construction, and maritime standards. - Commercial diving operations- Division 2/T, remove two obsolete recordkeeping requirements. - General industry and construction- remove requirements in numerous standards for employers to transfer specific records to the National Institute for Occupational Safety and Health (NIOSH). - Lead- amend trigger levels in general industry and construction.

In connection with rule changes in the SIP III rulemaking process, Oregon OSHA adopted additional changes to the subdivisions and rules opened during this rulemaking activity. We also made reference changes to underground installations in Division 3/P. Oregon OSHA repealed all of Division 2/I rules with the exception of 1910.134 respiratory protection, 1910.137 electrical protective equipment, 437-002-0138 additional Oregon rule for electrical protective equipment, 437-002-0139 working underway on water, and 437-002-1139, working over or in water. To replace them, we adopted new Oregon initiated rule 437-002-0134 personal protective equipment, that includes sections covering scope/application, hazard assessment, equipment, training, payment, fall protection, clothing, high visibility garments, eye, head, foot, let, hand and skin protection. The change in format simplifies the existing text while making little change to the overall rule requirements with the following exceptions: - modifies the hazard assessment requirement to clarify that employers must identify hazards to the entire body, including the torso and extremities, when performing the assessment. The assessment is currently limited to head, hands, eyes, and face and foot protection. - Change the fall protection component criteria to align with the systems criteria found in 1926.502 of the construction standards. The training requirement in this rule would also cover those parts not previously covered, such as fall protection.

As a logical extension of the federal OSHA SIP III changes to 1910.1003, we amended the Oregon rules for MOCA at Division 2/Z, 437-002-0364. The requirements for respiratory protection are updated and the requirements for transfer of records is simplified. Most transfer of medical records to NIOSH is eliminated with the SIP III rulemaking. The employer is required to follow the requirements of the respiratory protection rule and select appropriate respirators based on the selection criteria in 1910.134(d). (The type of respirator to use is no longer specified). We will also remove and reserve 437-002-0364(6)(a) which had a reporting requirement end date of December 1974.

This is Oregon OSHA Administrative Order 4-2011, filed and effective December 8, 2011.

**Note:** Oregon OSHA adopted changes to rules in general industry and construction. Federal OSHA published a number of rule changes in these industries in the June 8, 2011 Federal Register. This is Phase II of the Standards Improvement Project (SIP III), the third in a series of rulemaking by federal OSHA to improve and streamline the standards. This removes or revises individual requirements within rules that are confusing, outdated, duplicative, or inconsistent.

In connection with rule changes in the SIP III rulemaking process, Oregon OSHA adopted additional changes to the subdivisions and rules opened during this rulemaking activity.

We adopted new Oregon-initiated rules in Divisions 2/Z, 3/D, and 3/Z that replace the respiratory protection program paragraphs in the 1910 and 1926 substance specific rules referencing 1910.134 respiratory protection. The new rules expand the 1910.134 reference to include paragraphs (e) medical evaluation, and (o) appendices. Also, notes are added following each of these new rules to clarify that these requirements are in addition to other medical evaluation and respiratory protection related requirements in each rule. In most instances, that change in the requirement for a respirator medical evaluation (1910.134(e)) is a change in timing. Employers in many instances are already required to provide respirator medical evaluations based on contaminant exposure and required use of a respirator. Employers subject to the substance specific rules would be required to provide a respirator medical evaluation to determine the employee's ability to wear a respirator without adverse health effects before the employee is fit tested or required to use a respirator in the workplace. By adding section (o) of 1910.134, the new rules specify that all the Appendices to 1910.134 apply, providing approved procedures and respirator protocols to employers. These include Appendix A, fit testing procedures, Appendix B-1, user seal check procedures; Appendix B-2, respirator cleaning procedures; Appendix C, OSHA respirator medical evaluation questionnaire; and Appendix D, information for employees using respirators when not required under the standard.

This is Oregon OSHA Administrative Order 5-2011, filed December 8, 2011 and effective July 1, 2012.

**Note:** Federal OSHA modified its Hazard Communication Standard (HCS) to conform to the United Nations' Globally Harmonized System of Classification and Labelling of Chemicals (GHS). OSHA determined that the modifications will significantly reduce costs and burdens while also improving the quality and consistency of information provided to employers and employees regarding chemical hazards and associated protective measures. OSHA concluded this improved information will enhance the effectiveness of the HCS in ensuring that employees are apprised of the chemical hazards to which they may be exposure, and in reducing the incidence of chemical-related occupational illnesses and injuries.

The modifications to the standard include revised criteria for classification of chemical hazards; revised labelling provisions that include requirements for use of standardized signal words, pictograms, hazard statements, and precautionary statements; a specified format for safety data sheets; and related revisions to definition of terms used in the standard, and requirements for employee training on labels and safety data sheets. OSHA and Oregon OSHA are also modifying provisions of other standards, including standards for flammable and combustible liquids, spray finishing, reinforced plastics, dipping and coating, welding, cutting, and brazing, hazardous waste operations and emergency response, process safety management, pipe labelling, and most substance specific health standards, to ensure consistency with the modified HCS requirements. The consequences of these modifications will be to improve safety, to facilitate global harmonization of standards, and to produce hundreds of millions of dollars in annual savings nationally.

This rulemaking also repeals three Oregon-initiated rules: OAR 437-002-0289, Precautionary Labels, general requirements in Division 2/Q; 437-002-0361, regarding certain compliance dates for the ethylene oxide rule in Division 2/Z; and 437-003-0035, additional rules in hazard communication in Division 3/D. All three rules repealed are obsolete and unnecessary. The text of 1926.59 Hazard Communication in Division 3/D is repealed and a note added to refer the reader to 1910.1200 Hazard Communication in Division 2/Z (same as federal OSHA).

This is Oregon OSHA Administrative Order 5-2012, filed and effective September 25, 2012.

**Note:** Oregon OSHA is adopting changes to their administrative (recordkeeping), general industry, and construction standards, and updating references in the maritime activity standards in response to federal OSHA's adoption of final rules published in the May 14, 2019 Federal Register. This is Phase IV of federal OSHA's Standards Improvement Project (SIP-IV), the fourth in a series of rulemakings to improve and streamline workplace safety and health standards. Oregon's response removes or revises rules or requirements within our corresponding rules that are outdated, duplicative, or inconsistent. This rulemaking is anticipated to reduce regulatory burden and compliance costs while maintaining or enhancing worker safety and health as well as worker privacy protections.

In Division 2Z, Cotton Dust, Oregon OSHA removed requirements for employers to keep record of employee's social security numbers while doing recordkeeping, updated rule references, and updated Appendix B medical forms.

This is Oregon OSHA Administrative Order 3-2019, filed and effective October 29, 2019.