



Oregon Administrative Rules  
Chapter 437

Division 2

General Occupational Safety and Health

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# Coke Oven Emissions

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
437	002	N	0221	(1)	(a)(A)(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:*

(25) 29 CFR 1910.1029 Coke oven emissions, published 5/14/2019, 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. 10/29/12.

## 1910.1029 Coke Oven Emissions

(a) Scope and application. This section applies to the control of employee exposure to coke oven emissions, except that this section shall not apply to working conditions with regard to which other Federal agencies exercise statutory authority to prescribe or enforce standards affecting occupational safety and health.

(b) Definitions. For the purpose of this section:

**Authorized person** means any person specifically authorized by the employer whose duties require the person to enter a regulated area, or any person entering such an area as a designated representative of employees for the purpose of exercising the opportunity to observe monitoring and measuring procedures under paragraph (n) of this section.

**Beehive oven** means a coke oven in which the products of carbonization other than coke are not recovered, but are released into the ambient air.

**Coke oven** means a retort in which coke is produced by the destructive distillation or carbonization of coal.

**Coke oven battery** means a structure containing a number of slot-type coke ovens.

**Coke oven emissions** means the benzene-soluble fraction of total particulate matter present during the destructive distillation or carbonization of coal for the production of coke.

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

**Emergency** means any occurrence such as, but not limited to, equipment failure which is likely to, or does, result in any massive release of coke oven emissions.

**Existing coke oven battery** means a battery in operation or under construction on January 20, 1977, and which is not a rehabilitated coke oven battery.

**Green plush** means coke which when removed from the oven results in emissions due to the presence of unvolatilized coal.

**Pipeline charging** means any apparatus used to introduce coal into an oven which uses a pipe or duct permanently mounted onto an oven and through which coal is charged.

**Rehabilitated coke oven battery** means a battery which is rebuilt, overhauled, renovated, or restored such as from the pad up, after January 20, 1977.

**Secretary** means the Secretary of Labor, U.S. Department of Labor, or his or her designee.

**Sequential charging** means a procedure, usually automatically timed, by which a predetermined volume of coal in each larry car hopper is introduced into an oven such that no more than two hoppers commence or finish discharging simultaneously although, at some point, all hoppers are discharging simultaneously.

**Stage charging** means a procedure by which a predetermined volume of coal in each larry car hopper is introduced into an oven such that no more than two hoppers are discharging simultaneously.

- (c) Permissible exposure limit. The employer shall assure that no employee in the regulated area is exposed to coke oven emissions at concentrations greater than 150 micrograms per cubic meter of air (150  $\mu\text{g}/\text{m}^3$ ), averaged over any 8-hour period.
- (d) Regulated areas.
- (1) The employer shall establish regulated areas and shall limit access to them to authorized persons.
  - (2) The employer shall establish the following as regulated areas:
    - (i) The coke oven battery including topside and its machinery, pushside and its machinery, coke side and its machinery, and the battery ends; the wharf; and the screening station;
    - (ii) The beehive oven and its machinery.
- (e) Exposure monitoring and measurement.
- (1) Monitoring program.
    - (i) Each employer who has a place of employment where coke oven emissions are present shall monitor employees employed in the regulated area to measure their exposure to coke oven emissions.

- (ii) The employer shall obtain measurements which are representative of each employee's exposure to coke oven emissions over an eight-hour period. All measurements shall determine exposure without regard to the use of respiratory protection.
  - (iii) The employer shall collect fullshift (for at least seven continuous hours) personal samples, including at least one sample during each shift for each battery and each job classification within the regulated areas including at least the following job classifications:
    - (A) Lidman;
    - (B) Tar chaser;
    - (C) Larry car operator;
    - (D) Luterman;
    - (E) Machine operator, coke side;
    - (F) Benchman, coke side;
    - (G) Benchman, pusher side;
    - (H) Heater;
    - (I) Quenching car operator;
    - (J) Pusher machine operator;
    - (K) Screening station operator;
    - (L) Wharfman;
    - (M) Oven patcher;
    - (N) Oven repairman;
    - (O) Spellman; and
    - (P) Maintenance personnel.
  - (iv) The employer shall repeat the monitoring and measurements required by this paragraph (e)(1) at least every three months.
- (2) Redetermination. Whenever there has been a production, process, or control change which may result in new or additional exposure to coke oven emissions, or whenever the employer has any other reason to suspect an increase in employee exposure, the employer shall repeat the monitoring and measurements required by paragraph (e)(1) of this section for those employees affected by such change or increase.



- (3) 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 affected employee of these results either individually in writing or by posting the results in an appropriate location that is accessible to employees.
  - (ii) Whenever such results indicate that the representative employee exposure exceeds the permissible exposure limit, the employer shall, in such notification, inform each employee of that fact and of the corrective action being taken to reduce exposure to or below the permissible exposure limit.
- (4) Accuracy of measurement. The employer shall use a method of monitoring and measurement which has an accuracy (with a confidence level of 95%) of not less than plus or minus 35% for concentrations of coke oven emissions greater than or equal to 150  $\mu\text{g}/\text{m}^3$ .
- (f) Methods of compliance. The employer shall control employee exposure to coke oven emissions by the use of engineering controls, work practices and respiratory protection as follows:
- (1) Priority of compliance methods.
    - (i) Existing coke oven batteries.
      - (A) The employer shall institute the engineering and work practice controls listed in paragraphs (f)(2), (f)(3) and (f)(4) of this section in existing coke oven batteries at the earliest possible time, but not later than January 20, 1980, except to the extent that the employer can establish that such controls are not feasible. In determining the earliest possible time for institution of engineering and work practice controls, the requirement, effective August 27, 1971, to implement feasible administrative or engineering controls to reduce exposures to coal tar pitch volatiles, shall be considered. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below 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 the use of respiratory protection which complies with the requirements of paragraph (g) of this section.

- (B) The engineering and work practice controls required under paragraphs (f)(2), (f)(3) and (f)(4) of this section are minimum requirements generally applicable to all existing coke oven batteries. If, after implementing all controls required by paragraphs (f)(2), (f)(3) and (f)(4) of this section, or after January 20, 1980, whichever is sooner, employee exposures still exceed the permissible exposure limit, employers shall implement any other engineering and work practice controls necessary to reduce exposure to or below the permissible exposure limit except to the extent that the employer can establish that such controls are not feasible. Whenever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below 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 the use of respiratory protection which complies with the requirements of paragraph (g) of this section.
- (ii) New or rehabilitated coke oven batteries.
- (A) The employer shall institute the best available engineering and work practice controls on all new or rehabilitated coke oven batteries to reduce and maintain employee exposures at or below the permissible exposure limit, except to the extent that the employer can establish that such controls are not feasible. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below 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 the use of respiratory protection which complies with the requirements of paragraph (g) of this section.

(B) If, after implementing all the engineering and work practice controls required by paragraph (f)(1)(ii)(A) of this section, employee exposures still exceed the permissible exposure limit, the employer shall implement any other engineering and work practice controls necessary to reduce exposure to or below the permissible exposure limit except to the extent that the employer can establish that such controls are not feasible. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below 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 the use of respiratory protection which complies with the requirements of paragraph (g) of this section.

(iii) Beehive ovens.

(A) The employer shall institute engineering and work practice controls on all beehive ovens at the earliest possible time to reduce and maintain employee exposures at or below the permissible exposure limit, except to the extent that the employer can establish that such controls are not feasible. In determining the earliest possible time for institution of engineering and work practice controls, the requirement, effective August 27, 1971, to implement feasible administrative or engineering controls to reduce exposures to coal tar pitch volatiles, shall be considered. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below 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 the use of respiratory protection which complies with the requirements of paragraph (g) of this section.

(B) If, after implementing all engineering and work practice controls required by paragraph (f)(1)(iii)(A) of this section, employee exposures still exceed the permissible exposure limit, the employer shall implement any other engineering and work practice controls necessary to reduce exposures to or below the permissible exposure limit except to the extent that the employer can establish that such controls are not feasible. Whenever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below 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 the use of respiratory protection which complies with the requirements of paragraph (g) of this section.

(2) Engineering controls.

(i) Charging. The employer shall equip and operate existing coke oven batteries with all of the following engineering controls to control coke oven emissions during charging operations:

(A) One of the following methods of charging:

(1) Stage charging as described in paragraph (f)(3)(i)(B) of this section;  
or

(2) Sequential charging as described in paragraph (f)(3)(i)(B) of this section except that paragraph (f)(3)(i)(B)(3)(iv) of this section does not apply to sequential charging; or

(3) Pipeline charging or other forms of enclosed charging in accordance with paragraph (f)(2)(i) of this section, except that paragraphs (f)(2)(i)(B),(D),(E),(F) and (H) of this section do not apply;

(B) Drafting from two or more points in the oven being charged, through the use of double collector mains, or a fixed or moveable jumper pipe system to another oven, to effectively remove the gases from the oven to the collector mains;

(C) Aspiration systems designed and operated to provide sufficient negative pressure and flow volume to effectively move the gases evolved during charging into the collector mains, including sufficient steam pressure, and steam jets of sufficient diameter;

- (D) Mechanical volumetric controls on each larry car hopper to provide the proper amount of coal to be charged through each charging hole so that the tunnel head will be sufficient to permit the gases to move from the oven into the collector mains;
  - (E) Devices to facilitate the rapid and continuous flow of coal into the oven being charged, such as stainless steel liners, coal vibrators or pneumatic shells;
  - (F) Individually operated larry car drop sleeves and slide gates designed and maintained so that the gases are effectively removed from the oven into the collector mains;
  - (G) Mechanized gooseneck and standpipe cleaners;
  - (H) Air seals on the pusher machine leveler bars to control air infiltration during charging; and
  - (I) Roof carbon cutters or a compressed air system or both on the pusher machine rams to remove roof carbon.
- (ii) Coking. The employer shall equip and operate existing coke oven batteries with all of the following engineering controls to control coke oven emissions during coking operations;
- (A) A pressure control system on each battery to obtain uniform collector main pressure;
  - (B) Ready access to door repair facilities capable of prompt and efficient repair of doors, door sealing edges and all door parts;
  - (C) An adequate number of spare doors available for replacement purposes;
  - (D) Chuck door gaskets to control chuck door emissions until such door is repaired, or replaced; and
  - (E) Heat shields on door machines.
- (3) Work practice controls.
- (i) Charging. The employer shall operate existing coke oven batteries with all of the following work practices to control coke oven emissions during the charging operation:
- (A) Establishment and implementation of a detailed, written inspection and cleaning procedure for each battery consisting of at least the following elements:

- (1) Prompt and effective repair or replacement of all engineering controls;
  - (2) Inspection and cleaning of goosenecks and standpipes prior to each charge to a specified minimum diameter sufficient to effectively move the evolved gases from the oven to the collector mains;
  - (3) Inspection for roof carbon build-up prior to each charge and removal of roof carbon as necessary to provide an adequate gas channel so that the gases are effectively moved from the oven into the collector mains;
  - (4) Inspection of the steam aspiration system prior to each charge so that sufficient pressure and volume is maintained to effectively move the gases from the oven to the collector mains;
  - (5) Inspection of steam nozzles and liquor sprays prior to each charge and cleaning as necessary so that the steam nozzles and liquor sprays are clean;
  - (6) Inspection of standpipe caps prior to each charge and cleaning and luting or both as necessary so that the gases are effectively moved from the oven to the collector mains; and
  - (7) Inspection of charging holes and lids for cracks, warpage and other defects prior to each charge and removal of carbon to prevent emissions, and application of luting material to standpipe and charging hole lids where necessary to obtain a proper seal.
- (B) Establishment and implementation of a detailed written charging procedure, designed and operated to eliminate emissions during charging for each battery, consisting of at least the following elements:
- (1) Larry car hoppers filled with coal to a predetermined level in accordance with the mechanical volumetric controls required under paragraph (f)(2)(i)(d) of this section so as to maintain a sufficient gas passage in the oven to be charged;
  - (2) The larry car aligned over the oven to be charged, so that the drop sleeves fit tightly over the charging holes; and
  - (3) The oven charged in accordance with the following sequence of requirements:
    - (i) The aspiration system turned on;

- (i) Coal charged through the outermost hoppers, either individually or together depending on the capacity of the aspiration system to collect the gases involved;
  - (ii) The charging holes used under paragraph (f)(3)(i)(B)(3)(ii) of this section relidded or otherwise sealed off to prevent leakage of coke oven emissions;
  - (iv) If four hoppers are used, the third hopper discharged and relidded or otherwise sealed off to prevent leakage of coke oven emissions;
  - (v) The final hopper discharged until the gas channel at the top of the oven is blocked and then the chuck door opened and the coal leveled;
  - (vi) When the coal from the final hopper is discharged and the leveling operation complete, the charging hole relidded or otherwise sealed off to prevent leakage of coke oven emissions; and
  - (vii) The aspiration system turned off only after the charging holes have been closed.
- (C) Establishment and implementation of a detailed written charging procedure, designed and operated to eliminate emissions during charging of each pipeline or enclosed charged battery.
- (ii) Coking. The employer shall operate existing coke oven batteries pursuant to a detailed written procedure established and implemented for the control of coke oven emissions during coking, consisting of at least the following elements:
- (A) Checking oven back pressure controls to maintain uniform pressure conditions in the collecting main;
  - (B) Repair, replacement and adjustment of oven doors and chuck doors and replacement of door jambs so as to provide a continuous metal-to-metal fit;
  - (C) Cleaning of oven doors, chuck doors and door jambs each coking cycle so as to provide an effective seal;
  - (D) An inspection system and corrective action program to control door emissions to the maximum extent possible; and

- (E) Luting of doors that are sealed by luting each coking cycle and reluting, replacing or adjusting as necessary to control leakage.
- (iii) Pushing. The employer shall operate existing coke oven batteries with the following work practices to control coke oven emissions during pushing operations:
  - (A) Coke and coal spillage quenched as soon as practicable and not shoveled into a heated oven; and
  - (B) A detailed written procedure for each battery established and implemented for the control of emissions during pushing consisting of the following elements:
    - (1) Dampering off the ovens and removal of charging hole lids to effectively control coke oven emissions during the push;
    - (2) Heating of the coal charge uniformly for a sufficient period so as to obtain proper coking including preventing green pushes;
    - (3) Prevention of green pushes to the maximum extent possible;
    - (4) Inspection, adjustment and correction of heating flue temperatures and defective flues at least weekly and after any green push, so as to prevent green pushes;
    - (5) Cleaning of heating flues and related equipment to prevent green pushes, at least weekly and after any green push.
- (iv) Maintenance and repair. The employer shall operate existing coke oven batteries pursuant to a detailed written procedure of maintenance and repair established and implemented for the effective control of coke oven emissions consisting of the following elements:
  - (A) Regular inspection of all controls, including goosenecks, standpipes, standpipe caps, charging hold lids and castings, jumper pipes and air seals for cracks, misalignment or other defects and prompt implementation of the necessary repairs as soon as possible;
  - (B) Maintaining the regulated area in a neat, orderly condition free of coal and coke spillage and debris;
  - (C) Regular inspection of the damper system, aspiration system and collector main for cracks or leakage, and prompt implementation of the necessary repairs;
  - (D) Regular inspection of the heating system and prompt implementation of the necessary repairs;



- (E) Prevention of miscellaneous fugitive topside emissions;
  - (F) Regular inspection and patching of oven brickwork;
  - (G) Maintenance of battery equipment and controls in good working order;
  - (H) Maintenance and repair of coke oven doors, chuck doors, door jambs and seals; and
  - (I) Repairs instituted and completed as soon as possible, including temporary repair measures instituted and completed where necessary, including but not limited to:
    - (1) Prevention of miscellaneous fugitive topside emissions; and
    - (2) Chuck door gaskets, which shall be installed prior to the start of the next coking cycle.
- (4) Filtered air.
- (i) The employer shall provide positive-pressure, temperature controlled filtered air for larry car, pusher machine, door machine, and quench car cabs.
  - (ii) The employer shall provide standby pulpits on the battery topside, at the wharf, and at the screening station, equipped with positive-pressure, temperature controlled filtered air.
- (5) Emergencies. Whenever an emergency occurs, the next coking cycle may not begin until the cause of the emergency is determined and corrected, unless the employer can establish that it is necessary to initiate the next coking cycle in order to determine the cause of the emergency.
- (6) Compliance program.
- (i) Each employer shall establish and implement a written program to reduce exposures solely by means of the engineering and work practice controls required in paragraph (f) of this section.
  - (ii) The written program shall include at least the following:
    - (A) A description of each coke oven operation by battery, including work force and operating crew, coking time, operating procedures and maintenance practices;
    - (B) Engineering plans and other studies used to determine the controls for the coke battery;

- (C) A report of the technology considered in meeting the permissible exposure limit;
  - (D) Monitoring data obtained in accordance with paragraph (e) of this section;
  - (E) A detailed schedule for the implementation of the engineering and work practice controls required in paragraph (f) of this section; and
  - (F) Other relevant information.
- (iii) If, after implementing all controls required by paragraph (f)(2) through (f)(4) of this section, or after January 20, 1980, whichever is sooner, or after completion of a new or rehabilitated battery the permissible exposure limit is still exceeded, the employer shall develop a detailed written program and schedule for the implementation of any additional engineering controls and work practices necessary to reduce exposure to or below the permissible exposure limit.
  - (iv) Written plans for such programs shall be submitted, upon request, to the Secretary and the Director, and shall be available at the worksite for examination and copying by the Secretary, the Director, and the authorized employee representative. The plans required under paragraph (f)(6) of this section shall be revised and updated at least annually to reflect the current status of the program.
- (7) Training in compliance procedures. The employer shall incorporate all written procedures and schedules required under this paragraph (f) in the information and training program required under paragraph (k) of this section and, where appropriate, post in the regulated area.
- (g) Respiratory protection.
- (1) General. For employees who use respirators required 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) Work operations, such as maintenance and repair activity, for which engineering and work-practice controls are technologically 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 1910.1029(g)(2). In Oregon, OAR 437-002-1029 applies.

**437-002-1029    *Coke Oven Emissions 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 (d)(3)(iii)(B)(1) and (2)), and (e) through (m) and (o), which covers each employee required by Division 2/Z, 1910.1029 Coke Oven Emissions, to use a respirator.*

**Note:** *This is in addition to other respiratory protection and medical surveillance requirements specified in these Coke Oven Emissions 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.

1910.1029(g)(3) Respirator selection. The employers must select and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134; however, employers may use a filtering facepiece respirator only when it functions as a filter respirator for coke oven emissions particulates.

## (h) Protective clothing and equipment.

(1) Provision and use. The employer shall provide and assure the use of appropriate protective clothing and equipment, such as but not limited to:

- (i) Flame resistant jacket and pants;
- (ii) Flame resistant gloves;
- (iii) Face shields or vented goggles which comply with OAR 437-002-0134(8);
- (iv) Footwear providing insulation from hot surfaces for footwear;
- (v) Safety shoes which comply with OAR 437-002-0134(8); and
- (vi) Protective helmets which comply with OAR 437-002-0134(9).

## (2) Cleaning and replacement.

- (i) The employer shall provide the protective clothing required by paragraphs (h)(1)(i) and (ii) of this section in a clean and dry condition at least weekly.
- (ii) The employer shall clean, launder, or dispose of protective clothing required by paragraphs (h)(1)(i) and (ii) of this section.

- (iii) The employer shall repair or replace the protective clothing and equipment as needed to maintain their effectiveness.
  - (iv) The employer shall assure that all protective clothing is removed at the completion of a work shift only in change rooms prescribed in paragraph (i)(1) of this section.
  - (v) The employer shall assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closable container in the change room.
  - (vi) The employer shall inform any person who cleans or launders protective clothing required by this section, of the potentially harmful effects of exposure to coke oven emissions.
- (i) 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 paragraph (h)(1) 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 provide shower facilities in accordance with 1910.141(d)(3) of this part.
  - (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 the regulated area.
  - (4) Lavatories.
    - (i) The employer shall assure that employees working in the regulated area wash their hands and face prior to eating.
    - (ii) The employer shall provide lavatory facilities in accordance with 1910.141(d)(1) and (2) of this part.
  - (5) Prohibition of activities in the regulated area.

- (i) The employer shall assure that in the regulated area, food or beverages are not present or consumed, smoking products are not present or used, and cosmetics are not applied, except that these activities may be conducted in the lunchrooms, change rooms and showers required under paragraphs (i)(1) through (i)(3) of this section.
  - (ii) Drinking water may be consumed in the regulated area.
- (j) Medical surveillance.
- (1) General requirements.
    - (i) Each employer shall institute a medical surveillance program for all employees who are employed in a regulated area at least 30 days per year.
    - (ii) This program shall provide each employee covered under paragraph (j)(1)(i) of this section with an opportunity for medical examinations in accordance with this paragraph (j).
    - (iii) The employer shall inform any employee who refuses any required medical examination of the possible health consequences of such refusal and shall obtain a signed statement from the employee indicating that the employee understands the risk involved in the refusal to be examined.
    - (iv) The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician, and are provided without cost to the employee.
  - (2) Initial examinations. At the time of initial assignment to a regulated area or upon the institution of the medical surveillance program, the employer shall provide a medical examination for employees covered under paragraph (j)(1)(i) of this section including at least the following elements:
    - (i) A work history and medical history which shall include smoking history and the presence and degree of respiratory symptoms, such as breathlessness, cough, sputum production, and wheezing;
    - (ii) A 14-by17-inch or other reasonably-sized standard film or digital posterior-anterior chest x-ray;
    - (iii) Pulmonary function tests including forced vital capacity (FVC) and forced expiratory volume at one second (FEV 1.0) with recording of type of equipment used;
    - (iv) Weight;
    - (v) A skin examination;

- (vi) Urinalysis for sugar, albumin, and hematuria; and
  - (vii) A urinary cytology examination.
- (3) Periodic examinations.
- (i) The employer shall provide the examinations specified in paragraphs (j)(2)(i) and (iii) through (vi) of this section at least annually for employees covered under paragraph (j)(1)(i) of this section.
  - (ii) The employer must provide the examinations specified in paragraphs (j)(2)(i) and (iii) through (vii) of this section at least annually for employees 45 years of age or older or with five (5) or more years employment in the regulated area.
  - (iii) Whenever an employee who is 45 years of age or older or with five (5) or more years employment in a regulated area transfers or is transferred from employment in a regulated area, the employer must continue to provide the examinations specified in paragraphs (j)(2)(i) and (iii) through (vii) of this section annually, as long as that employee is employed by the same employer or a successor employer.
  - (iv) Whenever an employee has not taken the examinations specified in paragraphs (j)(3)(i) through (iii) of this section with the six (6) months preceding the termination of employment the employer shall provide such examinations to the employee upon termination of employment.
- (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 Appendixes;
  - (ii) A description of the affected employee's duties as they relate to the employee's exposure;
  - (iii) The employee's exposure level or estimated exposure level;
  - (iv) A description of any personal protective equipment used or to be used; and
  - (v) Information from previous medical examinations of the affected employee which is not readily available to the examining physician.
- (5) Physician's written opinion.
- (i) The employer shall obtain a written opinion from the examining physician which shall include:
    - (A) The results of the medical examinations;

- (B) 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 coke oven emissions;
  - (C) Any recommended limitations upon the employee's exposure to coke oven emissions or upon the use of protective clothing or equipment such as respirators; and
  - (D) 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.
- (ii) The employer shall instruct the physician not to reveal in the written opinion specific findings or diagnoses unrelated to occupational exposure.
  - (iii) The employer shall provide a copy of the written opinion to the affected employee.
- (k) Employee information and training.
- (1) Training program.
    - (i) The employer shall train each employee who is employed in a regulated area in accordance with the requirements of this section. The employer shall institute a training program and ensure employee participation in the program.
    - (ii) The training program shall be provided as of January 27, 1977 for employees who are employed in the regulated area at that time or at the time of initial assignment to a regulated area.
    - (iii) The training program shall be provided at least annually for all employees who are employed in the regulated area, except that training regarding the occupational safety and health hazards associated with exposure to coke oven emissions and the purpose, proper use, and limitations of respiratory protective devices shall be provided at least quarterly until January 20, 1978.
    - (iv) The training program shall include informing each employee of:
      - (A) The information contained in the substance information sheet for coke oven emissions (Appendix A);
      - (B) The purpose, proper use, and limitations of respiratory protective devices required in accordance with paragraph (g) of this section;

- (C) The purpose for and a description of the medical surveillance program required by paragraph (j) of this section including information on the occupational safety and health hazards associated with exposure to coke oven emissions;
- (D) A review of all written procedures and schedules required under paragraph (f) of this section; and
- (E) A review of this standard.
- (2) Access to training materials.
- (i) The employer shall make a copy of this standard and its appendices readily available to all employees who are employed in the regulated area.
- (ii) The employer shall provide upon request all materials relating to the employee information and training program to the Secretary and the Director.
- (l) Communication of hazards.
- (1) Hazard communication - general. The employer shall include coke oven emissions in the program established to comply with the Hazard Communication Standard (HCS) (1910.1200). The employer shall ensure that each employee has access to labels on containers of chemicals and substances associated with coke oven processes and to safety data sheets, and is trained in accordance with the provisions of HCS and paragraph (k) of this section. The employer shall ensure that at least the following hazard is addressed: Cancer.
- (2) Signs.
- (i) The employer shall post signs in the regulated area bearing the legend:
- DANGER  
COKE OVEN EMISSIONS  
MAY CAUSE CANCER  
DO NOT EAT, DRINK OR SMOKE  
WEAR RESPIRATORY PROTECTION IN THIS AREA  
AUTHORIZED PERSONNEL ONLY
- (ii) In addition, the employer shall post signs in the areas where the permissible exposure limit is exceeded bearing the legend:
- WEAR RESPIRATORY PROTECTION IN THIS AREA



- (iii) The employer shall ensure that no statement appears on or near any sign required by this paragraph (l) which contradicts or detracts from the effects of the required sign.
- (iv) The employer shall ensure that signs required by this paragraph (l)(2) are illuminated and cleaned as necessary so that the legend is readily visible.
- (v) Prior to June 1, 2016, employers may use the following legend in lieu of that specified in paragraph (l)(2)(i) of this section:

DANGER

CANCER HAZARD

AUTHORIZED PERSONNEL ONLY

NO SMOKING OR EATING

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

DANGER

RESPIRATOR REQUIRED

(3) Labels.

- (i) The employer shall ensure that labels of containers of contaminated protective clothing and equipment include the following information:

CONTAMINATED WITH COKE EMISSIONS

MAY CAUSE CANCER

DO NOT REMOVE DUST BY BLOWING OR SHAKING

- (ii) Prior to June 1, 2015, employers may include the following information on contaminated protective clothing and equipment in lieu of the labeling requirements in paragraph (l)(3)(i) of this section:

CAUTION

CLOTHING CONTAMINATED WITH COKE EMISSIONS

DO NOT REMOVE DUST BY BLOWING OR SHAKING

(m) Recordkeeping.

- (1) Exposure measurements. The employer shall establish and maintain an accurate record of all measurements taken to monitor employee exposure to coke oven emissions required in paragraph (e) of this section.

- (i) This record shall include:

- (A) Name and job classification of the employees monitored;
  - (B) The date(s), number, duration and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure where applicable;
  - (C) The type of respiratory protective devices worn, if any;
  - (D) A description of the sampling and analytical methods used and evidence of their accuracy; and
  - (E) The environmental variables that could affect the measurement of employee exposure.
- (ii) The employer shall maintain this record for at least 40 years or for the duration of employment plus 20 years, whichever is longer.
- (2) Medical surveillance. The employer shall establish and maintain an accurate record for each employee subject to medical surveillance as required by paragraph (j) of this section.
- (i) The record shall include:
- (A) The name and description of duties of the employee;
  - (B) A copy of the physician's written opinion;
  - (C) The signed statement of any refusal to take a medical examination under paragraph (j)(1)(ii) of this section; and
  - (D) Any employee medical complaints related to exposure to coke oven emissions.
- (ii) The employer shall keep, or assure that the examining physician keeps, the following medical records:
- (A) A copy of the medical examination results including medical and work history required under paragraph (j)(2) of this section;
  - (B) A description of the laboratory procedures used and a copy of any standards or guidelines used to interpret the test results;
  - (C) The initial x-ray;
  - (D) The x-rays for the most recent five (5) years;
  - (E) Any x-ray with a demonstrated abnormality and all subsequent x-rays;
  - (F) The initial cytologic examination slide and written description;
  - (G) The cytologic examination slide and written description for the most recent 10 years; and

(H) Any cytologic examination slides with demonstrated atypia, if such atypia persists for 3 years, and all subsequent slides and written descriptions.

(iii) The employer shall maintain medical records required under paragraph (m)(2) of this section for at least 40 years, or for the duration of employment plus 20 years, whichever is longer.

(3) Availability.

(i) The employer shall make available upon request all records required to be maintained by paragraph (m) of this section to the Secretary and the Director for examination and copying.

(ii) Employee exposure measurement 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) Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by paragraph (m) of this section.

(ii) The employer shall also comply with any additional requirements involving transfer of records set forth in 29 CFR 1910.1020(h).

(n) Observation of monitoring.

(1) Employee observation. The employer shall provide affected employees or their representatives an opportunity to observe any measuring or monitoring of employee exposure to coke oven emissions conducted pursuant to paragraph (e) of this section.

(2) Observation procedures.

(i) Whenever observation of the measuring or monitoring of employee exposure to coke oven emissions requires entry into an area where the use of protective clothing or equipment is required, the employer shall provide the observer with and assure the use of such equipment and shall require the observer to comply with all other applicable safety and health procedures.

(ii) Without interfering with the measurement, observers shall be entitled to:

(A) An Explanation of the measurement procedures;

(B) Observe all steps related to the measurement of coke oven emissions performed at the place of exposure; and

(C) Record the results obtained.

(o) Reserved.

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

[39 FR 23502, June 27, 1974, 41 FR 46784, Oct. 22, 1976, as amended at 42 FR 3304, Jan. 18, 1977; 45 FR 35283, May 23, 1980; 50 FR 37353, 37354, Sept. 13, 1985; 54 FR 24334, June 7, 1989; 61 FR 5508, Feb. 13, 1996; 63 FR 1290, Jan. 8, 1998; 63 FR 33468, June 18, 1998; 70 FR 1142, Jan. 5, 2005; 71 FR 16672, 16673, Apr. 3, 2006; 71 FR 50189, Aug. 24, 2006; 73 FR 75585, Dec. 12, 2008; 76 FR 33608, 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 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 3-2019, f. 10/29/19, ef. 10/29/19.

## Appendix A to 1910.1029 – Coke Oven Emissions Substance Information Sheet

### I. Substance Identification

#### A. Substance: Coke Oven Emissions

B. Definition: The benzene-soluble fraction of total particulate matter present during the destructive distillation or carbonization of coal for the production of coke.

C. Permissible Exposure Limit: 150 micrograms per cubic meter of air determined as an average over an 8-hour period.

D. Regulated areas: Only employees authorized by your employer should enter a regulated area. The employer is required to designate the following areas as regulated areas: the coke oven battery, including topside and its machinery, pushside and its machinery, cokeside and its machinery, and the battery ends; the screening station; and the wharf; and the beehive ovens and their machinery.

### II. Health Hazard Data

Exposure to coke oven emissions is a cause of lung cancer, and kidney cancer, in humans. Although there have not been an excess number of skin cancer cases in humans, repeated skin contact with coke oven emissions should be avoided.

### III. Protective Clothing and Equipment

A. Respirators: Respirators will be provided by your employer for routine use if your employer is in the process of implementing engineering and work practice controls or where engineering and work practice controls are not feasible or insufficient to reduce exposure to or below the PEL. You must wear respirators for non-routine activities or in emergency situations where you are likely to be exposed to levels of coke oven emissions in excess of the permissible exposure limit. Until January 20, 1978, the routine wearing of respirators is voluntary. Until that date, if you choose not to wear a respirator you do not have to do so. You must still have your respirator with you and you must still wear it if you are near visible emissions. Since how well your respirator fits your face is very important, your employer is required to conduct fit tests to make sure the respirator seals properly when you wear it. These tests are simple and rapid and will be explained to you during your training sessions.

B. Protective clothing: Your employer is required to provide, and you must wear, appropriate, clean, protective clothing and equipment to protect your body from repeated skin contact with coke oven emissions and from the heat generated during the coking process. This clothing should include such items as jacket and pants and flame resistant gloves. Protective equipment should include face shield or vented goggles, protective helmets and safety shoes, insulated from hot surfaces where appropriate.

#### IV. Hygiene Facilities and Practices

You must not eat, drink, smoke, chew gum or tobacco, or apply cosmetics in the regulated area, except that drinking water is permitted. Your employer is required to provide lunchrooms and other areas for these purposes.

Your employer is required to provide showers, washing facilities, and change rooms. If you work in a regulated area, you must wash your face, and hands before eating. You must shower at the end of the work shift. Do not take used protective clothing out of the change rooms without your employer's permission. Your employer is required to provide for laundering or cleaning of your protective clothing.

#### V. Signs and Labels

Your employer is required to post warning signs and labels for your protection. Signs must be posted in regulated areas. The signs must warn that a cancer hazard is present, that only authorized employees may enter the area, and that no smoking or eating is allowed. In regulated areas where coke oven emissions are above the permissible exposure limit, the signs should also warn that respirators must be worn.

#### VI. Medical Examinations

If you work in a regulated area at least 30 days per year, your employer is required to provide you with a medical examination every year. The initial medical examination must include a medical history, a chest x-ray; pulmonary function test; weight comparison; skin examination; a urinalysis, and a urine cytology exam for early detection of urinary cancer. Periodic examinations shall include all tests required in the initial examination, except that (1) the x-ray is to be performed during initial examination only and (2) the urine cytologic test is to be performed only on those employees who are 45 years or older, or have 5 or more years employment in the regulated area. The examining physician will provide a written opinion to your employer containing the results of the medical exams. You should also receive a copy of this opinion.

#### VII. Observation of Monitoring

Your employer is required to monitor your exposure to coke oven emissions and you are entitled to observe the monitoring procedure. You are entitled to receive an explanation of the measurement procedure, observe the steps taken in the measurement procedure, and to record the results obtained. When the monitoring procedure is taking place in an area where respirators or personal protective clothing and equipment are required to be worn, you must also be provided with and must wear the protective clothing and equipment.

#### VIII. Access to Records

You or your representative are entitled to records of your exposure to coke oven emissions upon request to your employer. Your medical examination records can be furnished to your physician upon request to your employer.

#### IX. Training and Education

Additional information on all of these items plus training as to hazards of coke oven emissions and the engineering and work practice controls associated with your job will also be provided by your employer.

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 4-1999, f. 4/30/99, ef. 4/30/99.

OR-OSHA Admin. Order 3-2019, f. 10/29/19, ef. 10/29/19.





## Appendix B to 1910.1029 – Industrial Hygiene and Medical Surveillance Guideline

### I. Industrial Hygiene Guidelines

#### A. Sampling (Benzene-Soluble Fraction Total Particulate Matter).

Samples collected should be full shift (at least 7-hour) samples. Sampling should be done using a personal sampling pump with pulsation damper at a flow rate of 2 liters per minute. Samples should be collected on 0.8 micrometer pore size silver membrane filters (37 mm diameter) preceded by Gelman glass fiber type A-E filters encased in three-piece plastic (polystyrene) field monitor cassettes. The cassette face cap should be on and the plug removed. The rotameter should be checked every hour to ensure that proper flow rates are maintained.

A minimum of three full-shift samples should be collected for each job classification on each battery, at least one from each shift. If disparate results are obtained for particular job classification, sampling should be repeated. It is advisable to sample each shift on more than one day to account for environmental variables (wind, precipitation, etc.) which may affect sampling. Differences in exposures among different work shifts may indicate a need to improve work practices on a particular shift. Sampling results from different shifts for each job classification should not be averaged. Multiple samples from same shift on each battery may be used to calculate an average exposure for a particular job classification.

#### B. Analysis.

1. All extraction glassware is cleaned with dichromic acid cleaning solution, rinsed with tap water, then dionized water, acetone, and allowed to dry completely. The glassware is rinsed with nanograde benzene before use. The Teflon cups are cleaned with benzene then with acetone.
2. Pre-weigh the 2 ml Teflon cups to one hundredth of a milligram (0.01 mg) on a autobalance AD 2 Tare weight of the cups is about 50 mg.
3. Place the silver membrane filter and glass fiber filter into a 15 ml test tube.
4. Extract with 5 ml of benzene for five minutes in an ultrasonic cleaner.
5. Filter the extract in 15 ml medium glass fritted funnels.
6. Rinse test tube and filters with two 1.5 ml aliquots of benzene and filter through the fritted glass funnel.

7. Collect the extract and two rinses in a 10 ml Kontes graduated evaporative concentrator.
8. Evaporate down to 1 ml while rinsing the sides with benzene.
9. Pipet 0.5 ml into the Teflon cup and evaporate to dryness in a vacuum oven at 40° C for 3 hours.
10. Weigh the Teflon cup and the weight gain is due to the benzene soluble residue in half the Sample.

## II. Medical Surveillance Guidelines

### A. General.

The minimum requirements for the medical examination for coke oven workers are given in paragraph (j) of the standard. The initial examination is to be provided to all coke oven workers who work at least 30 days in the regulated area. The examination includes a 14" x 17" of other reasonably-sized standard film or digital posterior-anterior chest x-ray reading, pulmonary function tests (FVC and FEV<sub>1</sub>), weight, urinalysis, skin examination, and a urinary cytologic examination. These tests are needed to serve as the baseline for comparing the employee's future test results. Periodic exams include all the elements of the initial exam except that (1) the x-ray is to be performed during initial examination only and (2) the urine cytologic test is to be performed only on those employees who are 45 years or older or who have worked for 5 or more years in the regulated area. The examination contents are minimum requirements; additional tests such as lateral and oblique x-rays or additional pulmonary function tests may be performed if deemed necessary.

### B. Pulmonary function tests.

Pulmonary function tests should be performed in a manner which minimizes subject and operator bias. There has been shown to be learning effects with regard to the results obtained from certain tests, such as FEV 1.0. Best results can be obtained by multiple trials for each subject. The best of three trials or the average of the last three of five trials may be used in obtaining reliable results. The type of equipment used (manufacturer, model, etc.) should be recorded with the results as reliability and accuracy varies and such information may be important in the evaluation of test results. Care should be exercised to obtain the best possible testing equipment.

[41 FR 46784, Oct. 22, 1976, as amended at 42 FR 3304, Jan. 18, 1977; 45 FR 35283, May 23, 1980; 50 FR 37353, 37354, Sept. 13, 1985; 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 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 3-2019, f. 10/29/19, ef. 10/29/19.



## Historical Notes for Subdivision Z

**Note:** Effective 11/1/93, Oregon OSHA has adopted by reference the remainder of the federal standards in Division 2Z, 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 grouped 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 (4,4'-Methylene bis (2-chloro-aniline)). 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 (OAR 437-02-377). Two Oregon codes will be retained in their entirety, renumbered, and redesignated as part of Division 2Z. These are Division 130, Thiram (see OAR 437-02-373), and Division 153, Pipe Labelling (see OAR 437-02-378). Two other Oregon codes have been repealed because they are no longer necessary. These are Division 140, Fumigation (of bedding), and Division 37-005, Railroad Sanitation and Drinking Water Facilities (PUC has jurisdiction over railroad employees).

This is Oregon OSHA Administrative Order 12-1993, adopted 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:** Federal OSHA made amendments in general industry and construction in both safety and health standards that will revise or eliminate duplicative, inconsistent, or unnecessary regulatory requirements without diminishing employee protections. Changes being made to health standards include reducing the frequency of required chest x-rays and eliminating sputum-cytology examinations for workers covered by the coke oven and inorganic arsenic standards, and changing the emergency response provisions of the vinyl chloride standard. Changes being made to OSHA safety standards include eliminating the public safety provisions of the temporary labor camp standard, eliminating unnecessary cross-references in the textile industry standards, and others.

This is Oregon OSHA Administrative Order 4-1999, adopted and effective April 30, 1999.

**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, leg, 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 standards, 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:** This rulemaking is to keep Oregon OSHA in harmony with recent changes to federal OSHA's standards. Federal OSHA published in the December 27, 2011 Federal Register corrections of typographical errors and non-substantive technical amendments to a number of standards in general industry, construction, and shipyard employment. The technical amendments include updating or revising cross-references. These revisions do not affect the substantive requirements or coverage of those standards, do not modify or revoke existing rights or obligations, and do not establish new rights or obligations. Oregon OSHA adopts these corrections and amendments to the standards Oregon has adopted previously to reflect federal OSHA's changes. We are also making rule reference changes in a number of standards to reflect the newly adopted OAR 437-002-0134, personal protective equipment.

This is Oregon OSHA Administrative Order 1-2012, filed and effective April 10, 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, Coke Oven Emissions, Oregon OSHA updated medical surveillance and examination terminology and removed requirements for employers to keep record of employee's social security numbers while doing recordkeeping.

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