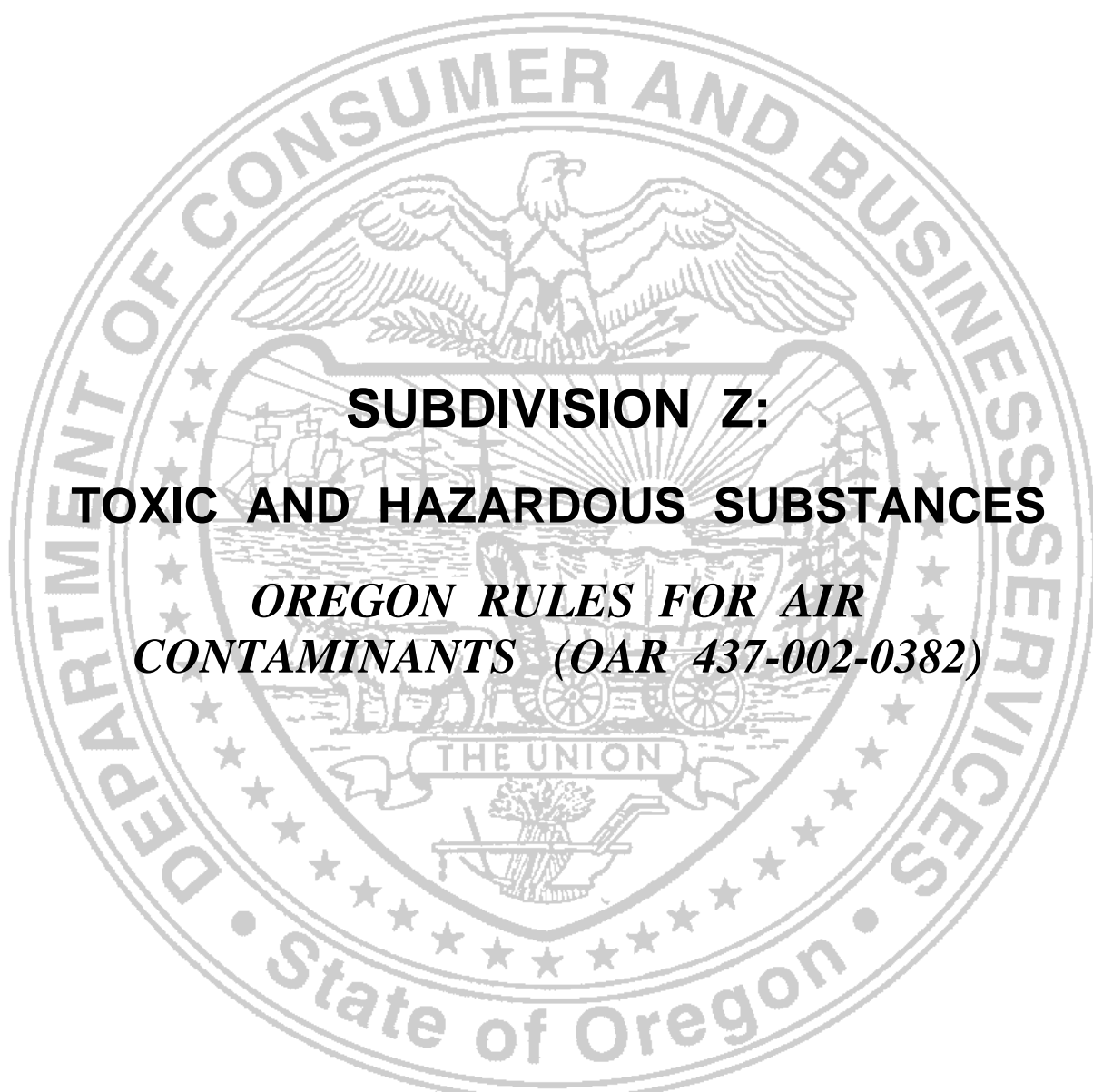


**OREGON OCCUPATIONAL
SAFETY AND HEALTH STANDARDS**

Oregon Administrative Rules, Chapter 437

**DIVISION 2 (29 CFR 1910)
GENERAL OCCUPATIONAL SAFETY & HEALTH RULES**



**SUBDIVISION Z:
TOXIC AND HAZARDOUS SUBSTANCES**
*OREGON RULES FOR AIR
CONTAMINANTS (OAR 437-002-0382)*

**Oregon Occupational Safety and Health Division (OR-OSHA)
Department of Consumer and Business Services
Salem, Oregon 97301-3882**

AO 6-2008

The Oregon Department of Consumer and Business Services adopted these rules pursuant to ORS 654.025(2).

The Secretary of State Designated OAR Chapter 437 as the “Oregon Occupational Safety and Health Code.” Six general subject areas within this code are designated as “Divisions.”

- **Division 1** General Administrative Rules
- **Division 2** General Occupational Safety and Health Rules
- **Division 3** Construction
- **Division 4** Agriculture
- **Division 5** Maritime Activities
- **Division 7** Forest Activities
- **Oregon Revised Statutes (ORS)** 654 The Oregon Safe Employment Act (OSEAct)

Oregon-initiated rules in this division of the Oregon Occupational Safety and Health Code 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 Basic Codification Structure adopted by the Secretary of State for Oregon Administrative Rules (OAR):

| Chapter | Division | Rule | Section | Subsection | Paragraphs |
|---------|----------|------|---------|------------|------------|
| 437 | 002 | 0322 | (1) | (a) | (A)(i)(I) |

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

| Chapter | Division | Part | Subpart (Subdivision) | Section | Paragraphs |
|---------|----------|------|--------------------------|---------|------------|
| 437 | 002 | 1910 | S | .303 | (a) |

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

To obtain an order form or copies of these codes, address:

**Department of Consumer & Business Services
Oregon Occupational Safety & Health Division (OR-OSHA)
350 Winter St. NE, Room 430
Salem, OR 97301-3882**

Or call the OR-OSHA Resource Library at 503-378-3272

The rules referenced in this division are available for viewing in the Office of the Secretary of State, Administrative Rules and Office Document Section, Oregon State Archives Building, Salem, Oregon 97310, or the Central Office, Oregon Occupational Safety and Health Division of the Department of Consumer and Business Services, Room 430, 350 Winter St. NE Salem, OR 97301-3882. Please visit our web site at: www.orosha.org

OAR 437, DIVISION 2

GENERAL OCCUPATIONAL SAFETY AND HEALTH RULES

SUBDIVISION Z – TOXIC AND HAZARDOUS SUBSTANCES

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 rules as printed in the Code of Federal Regulations, 29 CFR 1910, revised as of 7/1/98, and any subsequent amendments published in the Federal Register as listed below:*

(1) (Reserved) 29 CFR 1910.1000 **Air contaminants**, published 6/27/74, Federal Register, vol. 39, pp. 23540-23543; amended in the following FR publications: 5/28/75, vol. 40, pp. 23072-23073; 5/3/77, vol. 42, p. 22525; 1/17/78, vol. 43, p. 2600; 2/10/78, vol. 43, p. 5963; 3/29/78, vol. 43, p. 13563; 5/4/78, vol. 43, p. 19624; 6/23/78, vol. 43, p. 27394; 6/30/78, vol. 43, p. 28473; 10/3/78, vol. 43, p. 45809; 11/14/78, vol. 43, p. 53007; 12/8/78, vol. 43, pp. 57602-57603; 2/5/79, vol. 44, p. 7141; 6/18/80, vol. 45, pp. 12416-12417; 7/28/80, vol. 45, pp. 50328-50329; 6/19/81, vol. 46, p. 32022; 6/22/84, vol. 49, p. 25796; 1/2/85, vol. 50, p. 64; 12/13/85, vol. 50, p. 51173; 11/17/86, vol. 51, p. 41477; 9/11/87, vol. 52, p. 34562; 12/4/87, vol. 52, p. 46291; 1/19/89, vol. 54, pp. 2920-2983; 7/5/89, vol. 54, no. 127, pp. 28054-28061; 9/5/89, vol. 54, no. 170, pp. 36767-36768; 11/15/89, vol. 54, no. 219, p. 47513; 2/5/90, vol. 55, no. 24, pp. 3724; 5/9/90, vol. 55, no. 90, pp. 19258-19259; 11/8/90, vol. 55, no. 217, pp. 46948-46950; 7/1/92, vol. 57, no. 127, pp. 29204-29206.

NOTE: 29 CFR 1910.1000 was repealed on 11/15/93 by OR-OSHA. In Oregon, OAR 437-002-0382 applies.

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(3).

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).

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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.

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SUBDIVISION Z

TOXIC AND HAZARDOUS SUBSTANCES

437-002-0382 Oregon Rules for Air Contaminants.

An employee's exposure to any substance listed in Oregon Tables Z-1, Z-2, or Z-3 of this section shall be limited in accordance with the requirements of the following paragraphs of this section.

(1) Oregon Table Z-1.

(a) Substances with limits preceded by "C" – Ceiling Values. An employee's exposure to any substance in Oregon Table Z-1, the exposure limit of which is preceded by a "C", shall at no time exceed the exposure limit given for that substance. If instantaneous monitoring is not feasible, then the ceiling shall be assessed as a 15-minute time weighted average exposure which shall not be exceeded at any time during the working day.

(b) Other substances – 8-hour Time Weighted Averages. An employee's exposure to any substance in Oregon Table Z-1, the exposure limit of which is not preceded by a "C", shall not exceed the 8-hour Time Weighted Average given for that substance in any 8-hour work shift of a 40-hour work week.

(c) Other Substances – Excursion Limits. Excursions in worker exposure levels may exceed 3 times the PEL-TWA for no more than a total of 30 minutes during a workday, and under no circumstances should they exceed 5 times the PEL-TWA, provided that the PEL-TWA is not exceeded.

(d) Skin Designation. To prevent or reduce skin absorption, an employee's skin exposure to substances listed in Oregon Table Z-1 with an "X" in the Skin Designation column following the substance name shall be prevented or reduced to the extent necessary in the circumstances through the use of gloves, coveralls, goggles, or other appropriate personal protective equipment, engineering controls or work practices.

(2) Oregon Table Z-2. An employee's exposure to any substance listed in Oregon Table Z-2 shall not exceed the exposure limits specified as follows:

(a) 8-hour time weighted averages. An employee's exposure to any substance listed in Oregon Table Z-2, in any 8-hour work shift of a 40-hour work week, shall not exceed the 8-hour time weighted average limit given for that substance in Oregon Table Z-2.

(b) Acceptable ceiling concentrations. An employee's exposure to a substance listed in Oregon Table Z-2 shall not exceed the acceptable ceiling concentration for the given substance in the table at any time during an 8-hour shift except:

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(i) Acceptable maximum peak above the acceptable ceiling concentration for an 8-hour shift. An employee's exposure to a substance listed in Oregon Table Z-2 shall not exceed the acceptable maximum peak above the acceptable ceiling concentration, and shall not exceed the maximum duration for the given substance during an 8-hour shift.

(c) Example.

| Oregon Table Z-2 | | | | | |
|---|------------------------------|----------------------------------|---|-----------------------|------|
| Substance | 8-Hour Time-Weighted Average | Acceptable Ceiling Concentration | Acceptable Max. Peak Above the Acceptable Ceiling Concentration for an 8-hour Shift | | Skin |
| | | | Concentration | Maximum Duration | |
| Benzene (a) (Z87.4-1969) | 10 ppm | 25 ppm | 50 ppm | 10 min. | |
| Beryllium and beryllium compounds (Z37.17-1970) | 2 µg/m ³ | 5 µg/m ³ | 25 µg/m ³ | 30 min. | |
| Carbon tetrachloride (Z37.19-1967) | 10 ppm | 25 ppm | 200 ppm | 5 min. in any 4 hours | |

During an 8-hour work shift, an employee exposed to benzene may be exposed to an 8-hour time weighted average (TWA) of 10 ppm. Concentrations of benzene during the 8-hour work shift may not exceed 25 ppm, unless that exposure is no more than 50 ppm and does not exceed 10 minutes during an 8-hour work shift. Such exposures must be compensated by exposures to concentrations below 10 ppm so that the 8-hour time-weighted average is less than 10 ppm.

(d) Skin Designation. To prevent or reduce skin absorption, an employee's skin exposure to substances listed in Oregon Table Z-2 with an "X" in the Skin Designation column following the substance name shall be prevented or reduced to the extent necessary in the circumstances through the use of gloves, coveralls, goggles, or other appropriate personal protective equipment, engineering controls or work practices.

(3) Oregon Table Z-3. An employee's exposure to any substance listed in Oregon Table Z-3, in any 8-hour work shift of a 40-hour work week, shall not exceed the 8-hour time weighted average limit given for that substance in the table.

(4) Computation formulae. The computation formula which shall apply to employee exposure to more than one substance for which 8-hour time weighted averages are included in OAR 437, Division 2/Z, Toxic and Hazardous Substances, in order to determine whether an employee is exposed over the regulatory limit is as follows:

(a)

(i) The cumulative exposure for an 8-hour work shift shall be computed as follows:

$$E = (C_a T_a + C_b T_b + \dots C_n T_n) \div 8$$

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Where:

- E is the equivalent exposure for the working shift.
- C is the concentration during any period of time T where the concentration remain constant.
- T is the duration in hours of the exposure at the concentration C.

The value of E shall not exceed the 8-hour time weighted average specified in subpart Z of 29 CFR part 1910 for the substance involved.

(ii) To illustrate the formula prescribed in paragraph (4)(a)(i) of this section, assume that Substance A has an 8-hour time weighted average limit of 100 ppm (Oregon Table Z-1). Assume that an employee is subject to the following exposure:

- Two hours exposure at 150 ppm
- Two hours exposure at 75 ppm
- Four hours exposure at 50 ppm

Substituting this information in the formula, we have

$$[(2 \times 150) + (2 \times 75) + (4 \times 50)] \div 8 = 81.25 \text{ ppm}$$

Since 81.25 ppm is less than 100 ppm, the 8-hour time weighted average limit, the exposure is acceptable.

(b)

(i) In case of a mixture of air contaminants an employer shall compute the equivalent exposure as follows:

$$E_m = (C_1 \div L_1) + (C_2 \div L_2) + \dots (C_n \div L_n)$$

Where:

- E_m is the equivalent exposure for the mixture.
- C is the concentration of a particular contaminant.
- L is the exposure limit for that substance specified in Subpart Z of 29 CFR Part 1910.

The value of E_m shall not exceed unity (1).

(ii) To illustrate the formula prescribed in paragraph (4)(b)(i) of this section, consider the following exposures:

| Substance | Actual concentration of 8-hour exposure | 8-hour time weighted average exposure limit |
|-----------|---|---|
| B | 500 ppm | 1,000 ppm |
| C | 45 ppm | 200 ppm |
| D | 40 ppm | 200 ppm |

Substituting in the formula, we have:

$$E_m = (500 \div 1000) + (45 \div 200) + (40 \div 200)$$

$$E_m = 0.500 + 0.225 + 0.200$$

$$E_m = 0.925$$

Since E_m is less than unity (1), the exposure combination is within acceptable limits.

(5) To achieve compliance with paragraphs (1) through (4) of this section, administrative or engineering controls must first be determined and implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or any other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed in this section. Any equipment and/or technical measures used for this purpose must be approved for each particular use by a competent industrial hygienist or other technically qualified person. Whenever respirators are used, their use shall comply with 1910.134.

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NOTE: **Bold print** identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits.

| Oregon Table Z-1 - Adopted Values (In Alphabetical Order) | | | | |
|---|------------------------|--------------------|----------------------------------|------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| Abate | 3383-96-8 | — | 10 | |
| Acetaldehyde | 75-07-0 | 100 | 180 | |
| Acetic Acid | 64-19-7 | 10 | 25 | |
| Acetic anhydride | 108-24-7 | 5 | 20 | |
| Acetone | 67-64-1 | 1,000 | 2,400 | |
| Acetonitrile | 75-05-8 | 40 | 70 | |
| 2-Acetylaminoflourine | 53-96-3 | (C) | (See 1910.1003) | |
| Acetylene | 74-86-2 | 1,000 | — | |
| Acetylene dichloride, see 1,2-Dichloroethylene | | | | |
| Acetylene tetrabromide | 79-27-6 | 1 | 14 | |
| Acrolein | 107-02-8 | 0.1 | 0.25 | |
| Acrylamide | 79-06-1 | — | 0.3 | X |
| Acrylonitrile | 107-13-1 | | (See 1910.1045) | |
| Aldrin | 309-00-2 | — | 0.25 | X |
| Allyl alcohol | 107-18-6 | 2 | 5 | X |
| Allyl chloride | 107-05-1 | 1 | 3 | |
| Allyn glycidyl ether (AGE) | 106-92-3 | 5 (C) 10 | 22 (C) 45 | |
| Allyl propyl disulfide | 2179-59-1 | 2 | 12 | |
| alpha Alumina | 1344-28-1 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Aluminum Metal Dust | 7429-90-5 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Alundum (A1203) | | — | 10 | |
| 4-Aminodiphenyl | 92-67-1 | | (See 1910.1003) | |
| 2-Aminoethanol, see Ethanolamine | | | | |
| 2-Aminopyridine | 504-29-0 | 0.5 | 2 | |
| Ammonia | 7664-41-7 | 25 | 18 | |
| Ammonium Chloride Fumes | 12125-02-9 | — | 10 | |
| Ammonium sulfamate | 7773-06-0 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| n-Amyl acetate | 628-63-7 | 100 | 525 | |
| sec-Amyl acetate | 626-38-0 | 125 | 650 | |
| Aniline and homologs | 62-53-3 | 5 | 19 | X |
| Anisidine (o, p-isomers) | 29191-52-4 | | 0.5 | X |
| Antimony & Compounds (as Sb) | 7440-36-0 | — | 0.5 | |
| ANTU (alpha Naphthylthiourea) | 86-88-4 | — | 0.3 | |

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Oregon Administrative Rules
Oregon Occupational Safety
and Health Division

| Oregon Table Z-1 - Adopted Values (In Alphabetical Order) | | | | |
|---|------------------------|-------------------------------|----------------------------------|------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| Arsenic, Inorganic Compounds (as As) | 7440-38-2 | | 0.01 (See 1910.1018) | |
| Arsenic, Organic Compounds (as As) | 7440-38-2 | — | 0.5 | |
| Arsine | 7784-42-1 | 0.05 | 0.2 | |
| Asbestos | | (See 1910.1001 and 1926.1101) | | |
| Asphalt (petroleum) Fumes | 8052-42-4 | — | 5 | |
| Azinphos-methyl | 86-50-1 | — | 0.2 | X |
| Barium (soluble compounds) | 7440-39-3 | — | 0.5 | |
| Barium Sulfate | 7727-43-7 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Benomyl | 17804-35-2 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Benzene See Oregon Table Z-2 for the limits applicable in the operations or sectors excluded in 1910.1028 ^(d) | 71-43-2 | | (See 1910.1028) | |
| Benzidine | 92-87-5 | | (See 1910.1003) | |
| p-Benzoquinone, see Quinone | | | | |
| Benzoyl peroxide | 94-36-0 | — | 5 | |
| Benzyl chloride | 100-44-7 | 1 | 5 | |
| Beryllium and Beryllium compounds | 7440-41-7 | | (See Oregon Table Z-2) | |
| Biphenyl, see Diphenyl | | | | |
| Bismuth telluride (undoped) | 1304-82-1 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Bismuth telluride (Se-doped) | | — | 5 | |
| Bisphenol A, see Diglycidyl ether | | | | |
| Boron oxide | 1303-86-2 | — | 10 | |
| Boron tribromide | 10294-33-4 | 1 | 10 | |
| Boron trifluoride | 7637-07-2 | (C) 1 | (C) 3 | |
| Bromine | 7726-95-6 | 0.1 | 0.7 | |
| Bromine pentafluoride | 7789-30-2 | 0.1 | 0.7 | |
| Bromoform | 75-25-2 | 0.5 | 5 | X |
| Butadiene (1,3-Butadiene) | 106-99-0 | 1 ppm/5 ppm STEL | (See 1910.1051; 1910.19(l)) | |
| Butane | 106-97-8 | 800 | 1,900 | |
| Butanethiol, see Butyl mercaptan | | | | |
| 2-Butanone (Methyl Ethyl Ketone) | 78-96-3 | 200 | 590 | |
| 2-Butoxyethanol (Butyl cellosolve) | 111-76-2 | 50 | 240 | X |
| Butyl acetate (n-Butyl acetate) | 123-86-4 | 150 | 710 | |
| sec-Butyl acetate | 105-46-4 | 200 | 950 | |
| tert-Butyl acetate | 540-88-5 | 200 | 950 | |

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| Oregon Table Z-1 - Adopted Values (In Alphabetical Order) | | | | |
|---|------------------------|--|----------------------------------|------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| n-Butyl alcohol | 71-36-3 | 100 | 300 | |
| sec-Butyl alcohol | 78-92-2 | 150 | 450 | |
| tert-Butyl alcohol | 75-65-0 | 100 | 300 | |
| Butyl lactate | 138-22-7 | 1 | 5 | |
| Butylamine | 109-73-9 | (C) 5 | (C) 15 | X |
| tert-Butyl chromate (as CrO ₃) | 1189-85-1 | (See 1910.1026) ⁹ | | |
| n-Butyl glycidyl ether (BGE) | 2426-08-6 | 50 | 270 | |
| Butyl mercaptan | 109-79-5 | 0.5 | 1.5 | |
| p-tert-Butyltoluene | 98-51-1 | 10 | 60 | |
| Cadmium dust and fume (as Cd) | 7440-43-9 | (See 1910.1027, 1926.1127 and Division 4) 0.005 | | |
| Calcium carbonate | 1317-65-3 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Calcium hydroxide | 1305-62-0 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Calcium oxide | 1305-78-8 | — | 5 | |
| Calcium silicate | 1344-95-2 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Calcium sulfate | 7778-18-9 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Camphor, synthetic | 76-22-2 | — | 2 | |
| Caprolactam (2-Oxonexa- methyleneimine) | 105-60-2 | — | 5 | |
| Carbaryl (Sevin®) | 63-25-2 | — | 5 | |
| Carbon black | 1333-86-4 | — | 3.5 | |
| Carbon dioxide | 124-38-9 | 5,000 | 9,000 | |
| Carbon disulfide | 75-15-0 | | (See Oregon Table Z-2) | |
| Carbon monoxide | 630-08-0 | 50 | 55 | |
| Carbon tetrachloride | 56-23-5 | | (See Oregon Table Z-2) | |
| Cellulose | 9006-34-6 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Chlordane | 57-74-9 | — | 0.5 | X |
| Chlorinated camphene | 8001-35-2 | — | 0.5 | X |
| Chlorinated diphenyl oxide | 55720-99-5 | — | 0.5 | |
| Chlorine | 7782-50-5 | (C) 1 | (C) 3 | |
| Chlorine dioxide | 10049-04-4 | 0.1 | 0.3 | |
| Chlorine trifluoride | 7790-91-2 | (C) 0.1 | (C) 0.4 | |
| Chloroacetaldehyde | 107-20-0 | (C) 1 | (C) 3 | |

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Oregon Administrative Rules
Oregon Occupational Safety
and Health Division

| Oregon Table Z-1 - Adopted Values (In Alphabetical Order) | | | | |
|---|------------------------|--------------------|----------------------------------|------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| a-Chloroacetophenone (Phenacyl chloride) | 532-27-4 | 0.05 | 0.3 | |
| Chlorobenzene | 108-90-7 | 75 | 350 | |
| o-Chlorobenzylidene malononitrile | 2698-41-1 | 0.05 | 0.4 | |
| Chlorobromomethane | 74-97-5 | 200 | 1,050 | |
| 2-Chloro-1, 3-butadiene, see beta-Chloroprene | | | | |
| Chlorodiphenyl (42% Chlorine) | 53469-21-9 | — | 1 | X |
| Chlorodiphenyl (54% Chlorine) | 11097-69-1 | — | 0.5 | X |
| 1-Chloro, 2, 3-epoxypropane, see Epichlorhydrin | | | | |
| 2-Chloroethanol, see Ethylene chlorohydrin | | | | |
| Chloroethylene, see Vinyl Chloride | | | | |
| Chloroform (Trichloromethane) | 67-66-3 | (C) 25 | (C) 120 | |
| bis-Chloromethyl ether | 542-88-1 | | (See 1910.1003) | |
| Chloromethyl methyl ether | 107-30-2 | | (See 1910.1003) | |
| 1-Chloro-1-nitropropane | 600-25-9 | 20 | 100 | |
| Chloropicrin | 76-06-2 | 0.1 | 0.7 | |
| beta-Chloroprene (2-chloro-1,3-butadiene) | 126-99-8 | 25 | 90 | X |
| 2-Chloro-6-(trichloromethyl) pyridine | 1929-82-4 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Chromic acid and chromates (as CrO ₃) | | | (See Oregon Table Z-2) | |
| Chromium (II) compounds (as Cr) | 7440-47-3 | — | 0.5 | |
| Chromium (III) compounds (as Cr) | 7440-47-3 | — | 0.5 | |
| Chromium (VI) compounds | | | (See 1910.1026) | |
| Chromium metal & insol. salts (as Cr) | 7440-47-3 | — | 1 | |
| Clopidol | 2971-90-6 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Coal Dust | | | (See Oregon Table Z-3) | |
| Coal tar pitch volatiles (Benzene soluble fraction) anthracene, BaP, phenanthrene, acridine, chrysene, pyrene | 65966-93-2 | — | 0.2 (See 1910.1002) | |
| Cobalt metal, fume & dust | 7440-48-4 | — | 0.1 | |
| Coke oven emissions | | | (See 1910.1029) | |
| Copper fume | 7440-50-8 | — | 0.1 | |
| Dusts and Mists | 7440-50-8 | — | 1 | |
| Corundum (A1203) | 1302-74-5 | — | 10 | |
| Cotton dust | | | (See 1910.1043) | |
| Cotton dust (raw) | | — | 1 ^(e) | |

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| Oregon Table Z-1 - Adopted Values (In Alphabetical Order) | | | | |
|---|------------------------|--------------------|----------------------------------|----------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| Crag® herbicide (Sesone) | 136-78-7 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Cresol (all isomers) | 1319-77-3 | 5 | 22 | X |
| Crotonaldehyde | 123-73-9/ 4170-30-3 | 2 | 6 | |
| Cumene | 98-82-8 | 50 | 245 | X |
| Cyanides (as CN) | | — | 5 | X |
| Cyanogen | 460-19-5 | 10 | — | |
| Cyclohexane | 110-82-7 | 300 | 1,050 | |
| Cyclohexanol | 108-93-0 | 50 | 200 | |
| Cyclohexanone | 108-94-1 | 50 | 200 | |
| Cyclohexene | 110-83-8 | 300 | 1,015 | |
| Cyclopentadiene | 542-92-7 | 75 | 200 | |
| 2,4-D (Dichlorophenoxyacetic acid) | 94-75-7 | — | 10 | |
| DDT | 50-29-3 | — | 1 | X |
| DDVP, see Dichlorvos | | | | |
| Decaborane | 17702-41-9 | 0.05 | 0.3 | X |
| Demeton® (Systox) | 8065-48-3 | — | 0.1 | X |
| Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone) | 123-42-2 | 50 | 240 | |
| 1, 2-Diaminoethane, see Ethylenediamine | | | | |
| Diazinon | 333-41-5 | — | 0.1 | X |
| Diazomethane | 334-88-3 | 0.2 | 0.4 | |
| Diborane | 19287-45-7 | 0.1 | 0.1 | |
| Dibrom® | 300-76-5 | — | 3 | |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 0.001 | (See 1910.1044) | |
| 1,2-Dibromoethane, see Ethylene dibromide | | | | |
| 2-N-Dibutylaminoethanol | 102-81-8 | 2 | 14 | X |
| Dibutyl phosphate | 107-66-4 | 1 | 5 | |
| Dibutyl phthalate | 84-74-2 | — | 5 | |
| Dichloroacetylene | 7572-29-4 | (C) 0.1 | (C) 0.4 | |
| o-Dichlorobenzene | 95-50-1 | (C) 50 | (C) 300 | |
| p-Dichlorobenzene | 106-46-7 | 75 | 450 | |
| 3,3-Dichlorobenzidine | 91-94-1 | | (See 1910.1003) | X |
| Dichlorodifluoromethane | 75-71-8 | 1,000 | 4,950 | |
| 1,3-Dichloro-5, 5-dimethyl hydantoin | 118-52-5 | — | 0.2 | |
| Dichlorodiphenyltrichloroethane (DDT) | 50-29-3 | — | 1 | X |
| 1, 1-Dichloroethane | 75-34-3 | 100 | 400 | |
| 1, 2-Dichloroethane, see Ethylene dichloride | | | | |
| 1, 2-Dichlorethylene | 540-59-0 | 200 | 790 | |

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| Oregon Table Z-1 - Adopted Values (In Alphabetical Order) | | | | |
|---|---------------------------------|--------------------|----------------------------------|----------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| Dichloroethyl Ether | 111-44-4 | 5 (C) 15 | 30 (C) 90 | X |
| Dichloromethane, see Methylene chloride | | | | |
| Dichloromonofluoromethane | 75-43-4 | 1,000 | 4,200 | |
| 1, 1-Dichloro-1-nitroethane | 594-72-9 | (C) 10 | (C) 60 | |
| 1, 2-Dichloropropane, see Propylene dichloride | | | | |
| Dichlorotetrafluoroethane | 76-14-2 | 1,000 | 7,000 | |
| Dichlorvos (DDVP) | 62-73-7 | 0.1 | 1 | X |
| Dicyclohexylmethane 4,4'-diisocyanate (hydrogenated MDI, see Oregon Table Z-2 (Diisocyanates)) | 5124-30-1 | | | |
| Dicyclopentadienyl iron Total Dust Respirable Fraction | 102-54-5 | — — | 10 5 | |
| Dieldrin | 60-57-1 | — | 0.25 | X |
| Diethylamine | 109-89-7 | 25 | 75 | |
| 2-Diethylaminoethanol | 100-37-8 | 10 | 50 | X |
| Diethylene triamine | 111-40-0 | (C) 1 | (C) 4 | X |
| Diethylether, see Ethyl ether | | | | |
| Difluorodibromomethane | 75-61-6 | 100 | 860 | |
| Diglycidyl ether (DGE) | 2238-07-5 | (C) 0.5 | (C) 2.8 | |
| Dihydroxybenzene, see Hydroquinone | | | | |
| Diisobutyl ketone | 108-83-8 | 25 | 150 | |
| Diisopropylamine | 108-18-9 | 5 | 20 | X |
| Dimethoxymethane, see Methylal | | | | |
| Dimethyl acetamide | 127-19-5 | 10 | 35 | X |
| Dimethylamine | 124-40-3 | 10 | 18 | |
| 4-Dimethylaminoazobenzene | 60-11-7 | | (See 1910.1003) | |
| Dimethylaminobenzene, see Xylidene | | | | |
| Dimethylaniline (N,N-Dimethy-laniline) | 121-69-7 | 5 | 25 | X |
| Dimethylbenzene, see Xylene | | | | |
| Dimethyl-1,2-dibromo-2, 2-dichloroethyl phosphate | 300-76-5 | — | 3 | |
| Dimethylformamide | 68-12-2 | 10 | 30 | X |
| 2,6-Dimethylheptanone, see Diisobutyl ketone | | | | |
| 1,1-Dimethylhydrazine | 57-14-7 | 0.5 | 1 | X |
| Dimethylphthalate | 131-11-3 | — | 5 | |
| Dimethyl sulfate | 77-78-1 | 1 | 5 | X |
| Dinitrobenzene (all isomers) (ortho) (meta) (para) | 528-29-0 99-65-0 100-25-4 | | 1 | X |
| Dinitro-o-cresol | 534-52-1 | — | 0.2 | X |

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| Oregon Table Z-1 - Adopted Values (In Alphabetical Order) | | | | |
|---|------------------------|--------------------|----------------------------------|----------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| Dinitrotoluene | 25321-14-6 | — | 1.5 | X |
| Dioxane (Diethylene dioxide) | 123-91-1 | 100 | 360 | X |
| Diphenyl (Biphenyl) | 92-52-4 | 0.2 | 1 | |
| Diphenylamine | 122-39-4 | — | 10 | |
| Diphenylmethane diisocyanate (MDI), see Oregon Table Z-2 (Diisocyanates) | | | | |
| Dipropylene glycol methyl ether | 34590-94-8 | 100 | 600 | X |
| Diquat | 231-36-7 | — | 0.5 | |
| Di-sec, octyl phthalate (Di-2-ethyl- hexylphthalate) | 117-81-7 | — | 5 | |
| Emery | 12415-34-8 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Endosulfan (Thiodan®) | 115-29-7 | — | 0.1 | X |
| Endrin | 72-20-8 | — | 0.1 | X |
| Epichlorohydrin | 106-89-8 | 5 | 19 | X |
| EPN | 2104-64-5 | — | 0.5 | X |
| 1,2-Epoxypropane, see Propylene oxide | | | | |
| 2,3-Epoxy-1-propanol, see Glycidol | | | | |
| Ethane | 74-84-0 | 1,000 | — | |
| Ethanethiol, see Ethyl mercaptan | | | | |
| Ethanolamine | 141-43-5 | 3 | 6 | |
| 2-Ethoxyethanol (Cellosolve) | 110-80-5 | 100 | 370 | X |
| 2-Ethoxyethylacetate (Cellosolve acetate) | 111-15-9 | 100 | 540 | X |
| Ethyl acetate | 141-78-6 | 400 | 1,400 | |
| Ethyl acrylate | 140-88-5 | 25 | 100 | X |
| Ethyl alcohol (ethanol) | 64-17-5 | 1,000 | 1,900 | |
| Ethylamine | 75-04-7 | 10 | 18 | |
| Ethyl amyl ketone (5-methyl-3-heptanone) | 541-85-5 | 25 | 130 | |
| Ethyl benzene | 100-41-4 | 100 | 435 | |
| Ethyl bromide | 74-96-4 | 200 | 890 | |
| Ethyl butyl ketone (3-Heptanone) | 106-35-4 | 50 | 230 | |
| Ethyl chloride | 75-00-3 | 1,000 | 2,600 | |
| Ethyl ether | 60-29-7 | 400 | 1,200 | |
| Ethyl formate | 109-94-4 | 100 | 300 | |
| Ethyl mercaptan | 75-08-1 | 0.5 | 1 | |
| | | (C) 10 | (C) 25 | |
| Ethyl silicate | 78-10-4 | 100 | 850 | |
| Ethylene | 74-85-1 | 1,000 | — | |
| Ethylene chlorohydrin | 107-07-3 | 5 | 16 | X |
| Ethylenediamine | 107-15-3 | 10 | 25 | |
| Ethylene dibromide | 106-93-4 | | (See Oregon Table Z-2) | |

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|--|------------------------|--------------------|----------------------------------|------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| Ethylene dichloride | 107-06-2 | | (See Oregon Table Z-2) | |
| Ethylene glycol particulate | | — | 10 | |
| Ethylene glycol, Vapor | 107-21-1 | 100 | 260 | |
| Ethylene glycol dinitrate | 628-96-6 | (C) 0.2 | (C) 1 | X |
| Ethylene glycol methyl acetate (Methyl cellosolve acetate) (2-Methoxy-ethyl acetate) | 110-49-6 | 25 | 120 | X |
| Ethylenimine | 151-56-4 | | (See 1910.1003) | |
| Ethylene oxide | 75-21-8 | 1 | (See 1910.1047) | |
| Ethylidene chloride, see 1, 1-Dichloroethane | | | | |
| N-Ethylmorpholine | 100-74-3 | 20 | 94 | X |
| Ferbam | 14484-64-1 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Ferrovandium dust | 12604-58-9 | — | 1 | |
| Fibrous glass, see Glass, Fibrous | | | | |
| Fluorides (As F) | | — | 2.5 (See Oregon Table Z-2) | |
| Fluorine | 7782-41-4 | 0.1 | 0.2 | |
| Fluorotrichloromethane (Trichlorofluoromethane) | 75-69-4 | 1,000 | 5,600 | |
| Formaldehyde | 50-00-0 | 0.75 | (See 1910.1048) | |
| Formic acid | 64-18-6 | 5 | 9 | |
| Furfural | 98-01-1 | 5 | 20 | X |
| Furfuryl alcohol | 98-00-0 | 5 | 20 | |
| Gasoline | 8006-61-9 | — | ^(g) | |
| Germanium tetrahydride | 7782-65-2 | 0.2 | 0.6 | |
| Glass, Fibrous or dust | | — | 10 | |
| Glycerin (mist) | 56-81-5 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Glycidol | 556-52-5 | 50 | 150 | |
| Glycol momoethyl ether, see 2-Ethoxyethanol | | | | |
| Grain dust (oat, wheat, barley) | | — | 10 | |
| Graphite natural, respirable | 7782-42-5 | | (See Oregon Table Z-3) | |
| Graphite (Synthetic) | 7782-42-5 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Guthion®, see Azinphosmethyl | | | | |
| Gypsum | 13397-24-5 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Hafnium | 7440-58-6 | — | 0.5 | |

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| Oregon Table Z-1 - Adopted Values (In Alphabetical Order) | | | | |
|---|------------------------|--------------------|----------------------------------|----------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| Heptachlor | 76-44-8 | — | 0.5 | X |
| Heptane (n-heptane) | 142-82-5 | 500 | 2,000 | |
| Hexachlorocyclopentadiene | 77-47-4 | 0.1 | 1 | |
| Hexachloroethane | 67-72-1 | 1 | 10 | X |
| Hexachloronaphthalene | 1335-87-1 | — | 0.2 | X |
| Hexafluoroacetone | 684-16-2 | 0.1 | 0.7 | X |
| Hexamethylene diisocyanate (HDI), see Oregon Table Z-2 (Diisocyanates) | 822-06-0 | | | |
| 1,6 Hexamethylene diisocyanate Based Adduct, see Oregon Table Z-2 (Diisocyanates) | | | | |
| Hexane (n-hexane) | 110-54-3 | 500 | 1,800 | |
| 2-Hexanone | 591-78-6 | 100 | 410 | |
| Hexone (Methyl isobutyl ketone) | 108-10-1 | 100 | 410 | |
| sec-Hexyl acetate | 108-84-9 | 50 | 300 | |
| Hydrazine | 302-01-2 | 1 | 1.3 | X |
| Hydrogen | 1333-74-0 | 1,000 | — | |
| Hydrogen bromide | 10035-10-6 | 3 | 10 | |
| Hydrogen chloride | 7647-01-0 | (C) 5 | (C) 7 | |
| Hydrogen cyanide | 74-90-8 | 10 | 11 | X |
| Hydrogen fluoride (as F) | 7664-39-3 | | (See Oregon Table Z-2) | |
| Hydrogen peroxide | 7722-84-1 | 1 | 1.4 | |
| Hydrogen selenide (as Se) | 7783-07-5 | 0.05 | 0.2 | |
| Hydrogen sulfide | 7783-06-4 | | (See Oregon Table Z-2) | |
| Hydroquinone | 123-31-9 | — | 2 | |
| Indene | 95-13-6 | 10 | 45 | |
| Indium and compounds (as In) | 7440-74-6 | — | 0.1 | |
| Iodine | 7553-56-2 | (C) 0.1 | (C) 1 | |
| Iron oxide fume | 1309-37-1 | — | 10 | |
| Iron pentacarbonyl | 13463-40-6 | 0.1 | 0.23 | |
| Iron salts, soluble, as Fe | | — | 1 | |
| Isoamyl acetate | 123-92-2 | 100 | 525 | |
| Isoamyl alcohol (primary and secondary) | 123-51-3 | 100 | 360 | |
| Isobutyl acetate | 110-19-0 | 150 | 700 | |
| Isobutyl alcohol | 78-83-1 | 100 | 300 | |
| Isophorone | 78-59-1 | 10 | 55 | |
| Isophorone diisocyanate (IPDI), see Oregon Table Z-2 (Diisocyanates) | 4098-71-9 | | | |
| Isopropyl acetate | 108-21-4 | 250 | 950 | |
| Isopropyl alcohol | 67-63-0 | 400 | 980 | |
| Isopropylamine | 75-31-0 | 5 | 12 | |
| Isopropyl ether | 108-20-3 | 250 | 1,050 | |

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|---|------------------------|--------------------------------|----------------------------------|----------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| Isopropyl glycidyl ether (IGE) | 4016-14-2 | 50 | 240 | |
| Kaolin | 1332-58-7 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Ketene | 463-51-4 | 0.5 | 0.9 | |
| Lead, inorganic (as Pb) | 7439-92-1 | (See 1910.1025 & 1926.62) 0.05 | | |
| Lead arsenate | 7784-40-9 | (See 1910.1018) | 0.01 | |
| Limestone | 1317-65-3 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Lindane | 58-89-9 | — | 0.5 | X |
| Lithium hydride | 7580-67-8 | — | 0.025 | |
| L.P.G. (Liquified petroleum gas) | 68476-85-7 | 1,000 | 1,800 | |
| Magnesite | 546-93-0 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Magnesium oxide fume | 1309-48-4 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Malathion | 121-75-5 | — | 10 | X |
| Maleic anhydride | 108-31-6 | 0.25 | 1 | |
| Manganese Compounds (as Mn) | 7439-96-5 | — | (C) 5 | |
| Manganese fume (as Mn) | 7439-96-5 | — | (C) 5 | |
| Marble | 1317-65-3 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Mercury (aryl, inorganic, organo, and vapor) (as Hg) | 7439-97-6 | | (See Oregon Table Z-2) | |
| Mesityl oxide | 141-79-7 | 25 | 100 | |
| Methane | 74-82-8 | 1,000 | — | |
| Methanethiol, see Methyl mercaptan | | | | |
| Methoxychlor | 72-43-5 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| 2-Methoxyethanol (Methyl Cellosolve) | 109-86-4 | 25 | 80 | X |
| 2-Methoxyethyl acetate (Methyl cellosolve acetate) | 110-49-6 | 25 | 120 | X |
| Methyl acetate | 79-20-9 | 200 | 610 | |
| Methyl acetylene (propyne) | 74-99-7 | 1,000 | 1,650 | |
| Methyl acetylene-propadiene mixture (MAPP) | | 1,000 | 1,800 | |
| Methyl acrylate | 96-33-3 | 10 | 35 | X |
| Methylacrylonitrile | 126-98-7 | 1 | 3 | X |
| Methylal (dimethoxymethane) | 109-87-5 | 1,000 | 3,100 | |
| Methyl alcohol (methanol) | 67-56-1 | 200 | 260 | |
| Methylamine | 74-89-5 | 10 | 12 | |
| Methyl amyl alcohol, see Methyl isobutyl | | | | |

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| Oregon Table Z-1 - Adopted Values (In Alphabetical Order) | | | | |
|--|------------------------|---|----------------------------------|----------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| carbinol | | | | |
| Methyl (n-amyl) ketone | 110-43-0 | 100 | 465 | |
| Methyl bromide | 74-83-9 | 15 (C) 20 | 60 (C) 80 | X |
| Methyl butyl ketone, see 2-Hexanone | | | | |
| Methyl cellosolve, see 2 Methoxy ethanol | | | | X |
| Methyl cellosolve acetate (Ethylene glycol monomethyl ether acetate) | 110-49-6 | 25 | 120 | X |
| Methyl Chloride | 74-87-3 | | (See Oregon Table Z-2) | |
| Methyl Chloroform (1,1,1-Trichloroethane) | 71-55-6 | 350 | 1,900 | |
| Methyl Chloromethyl ether | | | (See 1910.1003) | |
| Methyl 2-cyanoacrylate | 137-05-3 | 2 | 8 | |
| Methylcyclohexane | 108-87-2 | 500 | 2,000 | |
| Methylcyclohexanol | 25639-42-3 | 50 | 235 | |
| o-Methylcyclohexanone | 583-60-8 | 50 | 230 | X |
| 2-Methylcyclopentadienyl manganese tricarbonyl (as Mn) | 12108-13-3 | 0.1 | 0.2 | X |
| Methyl demeton | 8022-00-2 | — | 0.5 | X |
| Methyl ethyl ketone (MEK), see 2-Butanone | | | | |
| Methyl formate | 107-31-3 | 100 | 250 | |
| Methyl iodide | 74-88-4 | 5 | 28 | X |
| Methyl isoamyl ketone | 110-12-3 | 100 | 475 | |
| Methyl isobutyl carbinol | 108-11-2 | 25 | 100 | X |
| Methyl isobutyl ketone, see Hexone | | | | |
| Methyl isocyanate | 624-83-9 | 0.02 | 0.05 | X |
| Methyl mercaptan | 74-93-1 | 0.5 (C) 10 | 1 (C) 20 | |
| Methyl methacrylate | 80-62-6 | 100 | 410 | |
| Methyl parathion | 298-00-0 | — | 0.2 | X |
| Methyl propyl ketone, see 2-Pentanone | | | | |
| Methyl silicate | 681-84-5 | (C) 5 | (C) 30 | |
| a-Methyl styrene | 98-83-9 | (C) 100 | (C) 480 | |
| Methylene bisphenyl isocyanate (MDI) | 101-68-8 | (See Oregon Table Z-2 (diisocyanates)) | | |
| Methylenedianiline (MDA) | | (See 1910.1050 & 1926.60) 0.01 | | |
| Methylene Chloride | 75-09-2 | 25 | (See 1910.1052) | |
| Mineral Wool Fiber | | — | 10 | |
| MOCA | 101-14-4 | | (See 437-002-0346) | |
| Molybdenum (soluble compounds) | 7439-98-7 | — | 5 | |
| (insoluble compounds) | | — | 10 | |
| Monomethyl aniline | 100-61-8 | 2 | 9 | X |

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|---|---------------------------------|--------------------|----------------------------------|----------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| Monomethyl hydrazine | 60-34-4 | (C) 0.2 | (C) 0.35 | X |
| Morpholine | 110-91-8 | 20 | 70 | X |
| Naphtha (coal tar) | 8030-30-6 | 100 | 400 | |
| Naphthalene | 91-20-3 | 10 | 50 | |
| Naphthalene diisocyanate (NDI), see Oregon Table Z-2 (Diisocyanates) | 3173-72-6 | | | |
| alpha-Naphthylamine | 134-32-7 | | (See 1910.1003) | |
| beta-Naphthylamine | 91-59-8 | | (See 1910.1003) | |
| Nickel carbonyl (as Ni) | 13463-39-3 | 0.001 | 0.007 | |
| Nickel, metal and insoluble compounds, as Ni | 7440-02-0 | — | 1 | |
| Nickel, soluble compounds, (as Ni) | 7440-02-0 | — | 1 | |
| Nicotine | 54-11-5 | 0.075 | 0.5 | X |
| Nitric acid | 7697-37-2 | 2 | 5 | |
| Nitric oxide | 10102-43-9 | 25 | 30 | |
| p-Nitroaniline | 100-01-6 | 1 | 6 | X |
| Nitrobenzene | 98-95-3 | 1 | 5 | X |
| 4-Nitrodiphenyl | 92-93-3 | | (See 1910.1003) | |
| p-Nitrochlorobenzene | 100-00-5 | — | 1 | X |
| Nitroethane | 79-24-3 | 100 | 310 | |
| Nitrogen dioxide | 10102-44-0 | (C) 5 | (C) 9 | |
| Nitrogen trifluoride | 7783-54-2 | 10 | 29 | |
| Nitroglycerin | 55-63-0 | (C) 0.2 | (C) 2 | X |
| Nitromethane | 75-52-5 | 100 | 250 | |
| 1-Nitropropane | 108-03-2 | 25 | 90 | |
| 2-Nitropropane | 79-46-9 | 25 | 90 | |
| N-Nitrosodimethylamine | | | (See 1910.1003) | |
| Nitrotoluene (all isomers) | 88-72-2/ 99-08-1/ 99-99-0 | 5 | 30 | X |
| Nitrotrichloromethane, see Chloropicrin | | | | |
| Nitrous oxide | 10024-97-5 | 50 | 90 | |
| Octachloronaphthalene | 2234-13-1 | — | 0.1 | X |
| Octane | 111-65-9 | 400 | 1,900 | |
| Oil mist (mineral) | 8012-95-1 | — | 5 | |
| Oil mist, vapor | | — | ^(g) | |
| Osmium tetroxide (as Os) | 20816-12-0 | | 0.002 | |
| Oxalic acid | 144-62-7 | — | 1 | |
| Oxygen difluoride | 7783-41-7 | 0.05 | 0.1 | |
| Ozone | 10028-15-6 | 0.1 | 0.2 | |
| Parafin wax fume | 8002-74-2 | — | 1 | |
| Paraquat respirable dust | 4685-14-7/ | | | |

OREGON RULES FOR AIR CONTAMINANTS

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| Oregon Table Z-1 - Adopted Values (In Alphabetical Order) | | | | |
|---|-------------------------|--------------------|----------------------------------|----------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| | 1910-42-5/ 2074-50-2 | — | 0.5 | X |
| Parathion | 56-38-2 | — | 0.1 | X |
| Particulates not otherwise regulated (PNOR) ^(f) | | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Pentaborane | 19624-22-7 | 0.005 | 0.01 | |
| Pentachloronaphthalene | 1321-64-8 | — | 0.5 | X |
| Pentachlorophenol | 87-86-5 | — | 0.5 | X |
| Pentaerythritol | 115-77-5 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Pentane | 109-66-0 | 500 | 1,500 | |
| 2-Pentanone (Methyl propyl ketone) | 107-87-9 | 200 | 700 | |
| Perchloroethylene (tetrachloroethylene) | 127-18-4 | | (See Oregon Table Z-2) | |
| Perchloromethyl mercaptan | 594-42-3 | 0.1 | 0.8 | |
| Perchloryl fluoride | 7616-94-6 | 3 | 13.5 | |
| Perlite | 93763-70-3 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Petroleum distillates (naphtha) (Rubber Solvent) | | 500 | 2,000 ^(g) | |
| Phenol | 108-95-2 | 5 | 19 | X |
| Phenothiazine | 92-84-2 | — | 5 | X |
| p-Phenylene diamine | 106-50-3 | — | 0.1 | X |
| Phenyl ether (vapor) | 101-84-8 | 1 | 7 | |
| Phenyl ether – diphenyl mixture (vapor) | 8004-13-5 | 1 | 7 | |
| Phenylethylene, see Styrene | | | | |
| Phenyl glycidyl ether (PGE) | 122-60-1 | 10 | 60 | |
| Phenylhydrazine | 100-63-0 | 5 | 22 | X |
| Phenylphosphine | 638-21-1 | (C) 0.05 | (C) 0.25 | |
| Phosdrin (Mevinphos®) | 7786-34-7 | | 0.1 | X |
| Phosgene (carbonyl chloride) | 75-44-5 | 0.1 | 0.4 | |
| Phosphine | 7803-51-2 | 0.3 | 0.4 | |
| Phosphoric acid | 7664-38-2 | — | 1 | |
| Phosphorus (yellow) | 7723-14-0 | — | 0.1 | |
| Phosphorus pentachloride | 10026-13-8 | — | 1 | |
| Phosphorus pentasulfide | 1314-80-3 | — | 1 | |
| Phosphorus trichloride | 7719-12-2 | 0.5 | 3 | |
| Phthalic anhydride | 85-44-9 | 2 | 12 | |
| Picloram | 1918-02-1 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Picric acid | 88-89-1 | — | 0.1 | X |

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| Oregon Table Z-1 - Adopted Values (In Alphabetical Order) | | | | |
|---|------------------------|--------------------|----------------------------------|----------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| Pindone (2-Pivalyl-1, 3-indan-dione) | 83-26-1 | — | 0.1 | |
| Plaster of Paris | 26499-65-0 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Platinum (Soluble Salts) as Pt | 7440-06-4 | — | 0.002 | |
| Polychlorobiphenyls, see Chloro-diphenyls | | | | |
| Portland Cement | 65997-15-1 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Propane | 74-98-6 | 1,000 | 1,800 | |
| Beta-Propiolactone | 57-57-8 | | (See 1910.1003) | |
| Propargyl alcohol | 107-19-7 | 1 | — | X |
| n-Propyl acetate | 109-60-4 | 200 | 840 | |
| n-Propyl alcohol | 71-23-8 | 200 | 500 | |
| n-Propyl nitrate | 627-13-4 | 25 | 110 | |
| Propylene dichloride | 78-87-5 | 75 | 350 | |
| Propylene glycol monomethyl ether | 107-98-2 | 100 | 360 | |
| Propylene imine | 75-55-8 | 2 | 5 | X |
| Propylene oxide | 75-56-9 | 100 | 240 | |
| Propyne, see Methyl acetylene | | | | |
| Pyrethrum | 8003-34-7 | — | 5 | |
| Pyridine | 110-86-1 | 5 | 15 | |
| Quinone | 106-51-4 | 0.1 | 0.4 | |
| RDX (Cyclonite) | 121-82-4 | — | 1.5 | X |
| Rhodium, Metal fume and dusts, as Rh | 7440-16-6 | — | 0.1 | |
| Soluble salts | 7440-16-6 | — | 0.001 | |
| Ronnel | 299-84-3 | — | 10 | |
| Rosin core solder pyrolysis products (as Formaldehyde) | | — | 0.1 | |
| Rotenone | 83-79-4 | — | 5 | |
| Rouge | | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Selenium compounds (as Se) | 7782-49-2 | — | 0.2 | |
| Selenium hexafluoride (as Se) | 7783-79-1 | 0.05 | 0.4 | |
| Silica | | | (See Oregon Table Z-3) | |
| Silicon | 7440-21-3 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Silicon carbide | 409-21-2 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Silver, metal and soluble compounds (as Ag) | 7440-22-4 | — | 0.01 | |

OREGON RULES FOR AIR CONTAMINANTS

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| Oregon Table Z-1 - Adopted Values (In Alphabetical Order) | | | | |
|--|------------------------|--------------------|----------------------------------|----------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| Sodium fluoroacetate | 62-74-8 | — | 0.05 | X |
| Sodium hydroxide | 1310-73-2 | — | 2 | |
| Starch | 9005-25-8 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Stibine | 7803-52-3 | 0.1 | 0.5 | |
| Stoddard solvent | 8052-41-3 | 200 | 1,150 | |
| Strychnine | 57-24-9 | — | 0.15 | |
| Styrene | 100-42-5 | | (See Oregon Table Z-2) | |
| Subtilisins (Proteolytic enzymes) (as 100% pure crystalline enzyme) | 1395-21-7 | — | (C) 0.0003 | |
| Sucrose | 57-50-1 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Sulfur dioxide | 7446-09-5 | 5 | 13 | |
| Sulfur hexafluoride | 2551-62-4 | 1,000 | 6,000 | |
| Sulfuric acid | 7664-93-9 | — | 1 | |
| Sulfur monochloride | 10025-67-9 | 1 | 6 | |
| Sulfur pentafluoride | 5714-22-7 | 0.025 | 0.25 | |
| Sulfur tetrafluoride | 7783-60-0 | 0.1 | 0.4 | |
| Sulfuryl fluoride | 2699-79-8 | 5 | 20 | |
| Systox, see Demeton® | | | | |
| 2, 4, 5-T | 93-76-5 | — | 10 | |
| Tantalum, metal and oxide dust | 7440-25-7 | — | 5 | |
| TEDP (Sulfotepp) | 3689-24-5 | — | 0.2 | X |
| Tellurium and compounds (as Te) | 13494-80-9 | — | 0.1 | |
| Tellurium hexafluoride (as Te) | 7783-80-4 | 0.02 | 0.2 | |
| Temephos | 3383-96-8 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| TEPP (Tetraethyl pyrophosphate) | 107-49-3 | 0.004 | 0.05 | X |
| Terphenyls | 26140-60-3 | (C) 1 | (C) 9 | |
| 1, 1, 1, 2-Tetrachloro-2, 2-difluoro-ethane | 76-11-9 | 500 | 4,170 | |
| 1, 1, 2, 2-Tetrachloro-1, 2-difluoro-ethane | 76-12-0 | 500 | 4,170 | |
| 1, 1, 2, 2-Tetrachloroethane | 79-34-5 | 5 | 35 | X |
| Tetrachloroethylene, see Perchloroethylene | | | | |
| Tetrachloronaphthalene | 1335-88-2 | — | 2 | X |
| Tetrachloromethane, see Carbon tetrachloride | | | | |
| Tetraethyl lead (as Pb) | 78-0-2 | — | .075 | X |
| Tetrahydrofuran | 109-99-9 | 200 | 590 | |
| Tetramethyl lead (as Pb) | 75-74-1 | — | 0.075 | X |
| Tetramethyl succinonitrile | 3333-52-6 | 0.5 | 3 | X |

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Oregon Administrative Rules
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| Oregon Table Z-1 - Adopted Values (In Alphabetical Order) | | | | |
|---|------------------------|--------------------|----------------------------------|------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| Tetranitromethane | 509-14-8 | 1 | 8 | |
| Tetryl (2, 4, 6-trinitro-phenyl-methylnitramine) | 479-45-8 | — | 1.5 | X |
| Thallium (soluble compounds) as Tl | 7440-28-0 | — | 0.1 | X |
| 4,4'-Thiobis (6-tert, Butyl-m-cresol) | 96-69-5 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Thiram | 137-26-8 | | (See 437-002-0373) 0.15 | |
| Tin (inorganic compounds, except oxides) as Sn | 7440-31-5 | — | 2 | |
| Tin (organic compounds) | 7440-31-5 | — | 0.1 | |
| Tin oxide | 1332-29-2 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Titanium dioxide | 13463-67-7 | — | 10 | |
| Toluene (toluol) | 108-88-3 | | (See Oregon Table Z-2) | |
| Toluene diisocyanate (TDI), See Oregon Table Z-2 (Diisocyanates) | 584-84-9 | | | |
| o-Toluidine | 95-53-4 | 5 | 22 | X |
| Toxaphene, see Chlorinated camphene | | | | |
| Tributyl phosphate | 126-73-8 | — | 5 | |
| 1, 1, 1-Trichloroethane, see Methyl chloroform | | | | |
| 1, 1, 2-Trichloroethane | 79-00-5 | 10 | 45 | X |
| Trichloroethylene | 79-01-6 | | (See Oregon Table Z-2) | |
| Trichloromethane, see Chloroform | | | | |
| Trichloronaphthalene | 1321-65-9 | — | 5 | X |
| 1, 2, 3-Trichloropropane | 96-18-4 | 50 | 300 | |
| 1, 1, 2-Trichloro 1, 2, 2-trifluoro-ethane | 76-13-1 | 1,000 | 7,600 | |
| Triethylamine | 121-44-8 | 25 | 100 | |
| Trifluorobromomethane | 75-63-8 | 1,000 | 6,100 | |
| Trimethyl benzene | 25551-13-7 | 25 | 120 | |
| 2, 4, 6-Trinitrophenol, see Picric acid | | | | |
| 2, 4, 6-Trinitrophenylmethyl-nitramine, see Tetryl | | | | |
| Trinitrotoluene (TNT) | 118-96-7 | | 1.5 | X |
| Triorthocresyl phosphate | 78-30-8 | — | 0.1 | |
| Triphenyl phosphate | 115-86-6 | — | 3 | |
| Tungsten & compounds, as W | 7440-33-7 | | | |
| Soluble | | — | 1 | |
| Insoluble | | — | 5 | |
| Turpentine | 8006-64-2 | 100 | 560 | |
| Uranium (as U) | 7440-61-1 | | | |
| Soluble compounds | | — | 0.05 | |
| Insoluble compounds | | — | 0.2 | |

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| Oregon Table Z-1 - Adopted Values (In Alphabetical Order) | | | | |
|---|------------------------|--------------------|----------------------------------|------|
| Substance | CAS No. ^(c) | ppm ^(a) | mg/m ³ ^(b) | Skin |
| Vanadium respirable dust (as V₂O₅) | 1314-62-1 | — | (C) 0.5 | |
| Fume (as V₂O₅) | 1314-62-1 | — | (C) 0.05 | |
| Vegetable oil mist | | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Vinyl acetate | 108-05-4 | 10 | 30 | |
| Vinyl benzene, see Styrene | | | | |
| Vinyl bromide | 593-60-2 | 250 | 1,100 | |
| Vinyl chloride | 75-01-4 | | (See 1910.1017) | |
| Vinyl cyanide, see Acrylonitrile | | | | |
| Vinyl toluene | 25013-15-4 | 100 | 480 | |
| Warfarin | 81-81-2 | — | 0.1 | |
| Wood Dust (non-allergenic) | | — | 10 | |
| Xylene (o-, m-, p-isomers) | 1330-20-7 | 100 | 435 | |
| Xylidine | 1300-73-8 | 5 | 25 | X |
| Yttrium | 7440-65-5 | — | 1 | |
| Zinc chloride fume | 7646-85-7 | — | 1 | |
| Zinc oxide | 1314-13-2 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Zinc oxide fume | 1314-13-2 | — | 5 | |
| Zinc stearate | 557-05-1 | | | |
| Total Dust | | — | 10 | |
| Respirable Fraction | | — | 5 | |
| Zirconium compounds (as Zr) | 7440-67-7 | — | 5 | |

NOTE: Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits.

NOTE: PNOR means “particles not otherwise regulated.”

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OREGON RULES FOR AIR CONTAMINANTS

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FOOTNOTES:

- (a) Parts of vapor or gas per million parts of contaminated air by volume at 25°C and 760 torr.
- (b) Milligrams of substance per cubic meter of air. When entry is in this column only, the value is exact; when listed with a ppm entry, it is approximate.
- (c) The CAS number is for information only. Enforcement is based on the substance name. For an entry covering more than one metal compound, measured as the metal, the CAS number for the metal is given – not CAS numbers for the individual compounds.
- (d) The final benzene standard in 1910.1028 applies to all occupational exposures to benzene except in some circumstances the distribution and sale of fuels, sealed containers and pipelines, coke production, oil and gas drilling and production, natural gas processing, and the percentage exclusion for liquid mixtures; for the excepted subsegments, the benzene limits in Oregon Table Z-2 apply. See 1910.1028 for specific circumstances.
- (e) This 8-hour TWA applies to respirable dust as measured by a vertical elutriator cotton dust sampler or equivalent instrument. The time weighted average applies to the cotton waste processing operations of waste recycling (sorting, blending, cleaning, and willowing) and garnetting. See also 1910.1043 for cotton dust limits applicable to other sectors.
- (f) All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by the Particulates Not Otherwise Regulated (PNOR) limit which is the same as the inert or nuisance dust limit of Oregon Table Z-3.
- (g) Usually a mixture, in general the aromatic hydrocarbon content will determine which TWA applies.
- (h) If the exposure limit in 1910.1026 is stayed or is otherwise not in effect, the exposure limit is a ceiling of 0.1 mg/m³.
- (i) See Table Z-2 for the exposure limit for any operations or sectors where the exposure limit in 1910.1026 is stayed or is otherwise not in effect.

OREGON RULES FOR AIR CONTAMINANTS

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| Oregon Table Z-2 | | | | | |
|---|-------------------------------|----------------------------------|---|---|----------|
| Substance | 8-Hour Time-Weighted Average | Acceptable Ceiling Concentration | Acceptable Max. Peak Above the Acceptable Ceiling Concentration for an 8-hour Shift | | Skin |
| | | | Concentration | Maximum Duration | |
| Benzene ^(a) (Z87.4-1969) | 10 ppm | 25 ppm | 50 ppm | 10 min. | |
| Beryllium, and beryllium compounds (Z37.29-1970) | 2 µg/m ³ | 5 µg/m ³ | 25 µg/m ³ | 30 min. | |
| Cadmium fume ^(b) (Z37.5-1970) | 0.1 mg/m ³ | 0.3 mg/m ³ | | | |
| Cadmium dust ^(b) (Z37.5-1970) | 0.2 mg/m ³ | 0.6 mg/m ³ | | | |
| Carbon disulfide (Z37.3-1968) | 20 ppm | 30 ppm | 100 ppm | 30 min. | X |
| Carbon tetrachloride (Z37.17-1967) | 10 ppm | 25 ppm | 200 ppm | 5 min. in any 4 hrs | |
| Chromic acid and chromates (Z37.7-1971) (as CrO ₃) ^c | | 0.1 mg/m ³ | | | |
| Ethylene dibromide (Z37.31-1970) | 20 ppm | 25 ppm | 50 ppm | 5 min. | X |
| Ethylene dichloride (Z37.21-1969) | 50 ppm | 100 ppm | 200 ppm | 5 min. in any 3 hrs | |
| Fluoride as dust (Z37.28-1969) | 2.5 mg/m ³ | | | | |
| Formaldehyde (see 1910.1048) | | | | | |
| Hydrogen fluoride (Z37.28-1969) | 3 ppm | | | | |
| Hydrogen sulfide (Z37.2-1966) | | 20 ppm | 50 ppm | 10 min. once, only if no other measurable exposure occurs | |
| Mercury (Z37.8-1971) | 0.05 mg/m³ | 0.1 mg/m³ | | | X |
| Methyl chloride (Z37.18-1969) | 100 ppm | 200 ppm | 300 ppm | 5 min. in any 3 hrs | |
| Organo (alkyl) mercury (Z37.30-1969) | 0.001 mg/m³ | 0.01 mg/m³ | | | X |
| Styrene (Z37.15-1969) | 100 ppm | 200 ppm | 600 ppm | 5 min. in any 3 hrs | |
| Tetrachloroethylene (Z37.22-1967) | 100 ppm | 200 ppm | 300 ppm | 5 min. in any 3 hrs | |
| Toluene (Z37.12-1967) | 100 ppm | 300 ppm | 500 ppm | 10 min. | |
| Trichloroethylene (Z37.19-1967) | 100 ppm | 200 ppm | 300 ppm | 5 min. in any 2 hrs | |

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OREGON RULES FOR AIR CONTAMINANTS

| Oregon Table Z-2 (Continued) | | | | | |
|--|------------------------------------|-------------------------------------|---|------------------|------|
| Substance | 8-Hour Time-Weighted Average | Acceptable Ceiling Concentration | Acceptable Max. Peak Above the Acceptable Ceiling Concentration for an 8-hour Shift | | Skin |
| | | | Concentration | Maximum Duration | |
| Diisocyanates | | | | | |
| Dicyclohexylmethane 4,4'-diisocyanate (hydrogenated MDI) | .055 mg/m .005 ppm | 0.210 mg/m ³ 0.02 ppm | | | |
| Diphenylmethane diisocyanate (MDI) | .050 mg/m ³ .005 ppm | 0.200 mg/m ³ 0.02 ppm | | | |
| Hexamethylene diisocyanate (HDI) | .035 mg/m ³ .005 ppm | 0.140 mg/m ³ 0.02 ppm | | | |
| 1,6 Hexamethylene diisocyanated Based Adduct (includes HDI-Biuret trimer, and other polymeric forms of HDI, including isocyanurates) | 0.5 mg/m ³ | 1.0 mg/m ³ | | | |
| Isophorone diisocyanate (IPDI) | .045 mg/m ³ .005 ppm | 0.180 mg/m ³ 0.02 ppm | | | |
| Napthalene diisocyanate (NDI) | .040 mg/m ³ .005 ppm | 0.170 mg/m ³ 0.02 ppm | | | |
| Toluene diisocyanate (TDI) | .035 mg/m ³ .005 ppm | 0.140 mg/m ³ 0.02 ppm | | | |

NOTE: Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal limits.

FOOTNOTES:

- (a) This standard applies to the industry segments exempt from the 1 ppm 8-hour TWA and 5 ppm STEL of the Benzene Standard, 1910.1028.
- (b) This standard applies to any operations or sectors for which the Cadmium Standard, 1910.1027, is stayed or otherwise not in effect.
- (c) This standard applies to any operations or sectors for which the exposure limit in the Chromium (VI) standard, 1910.1026, is stayed or is otherwise not in effect.

OREGON RULES FOR AIR CONTAMINANTS

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| OREGON TABLE Z-3 - MINERAL DUSTS | | |
|--|-------------------|--|
| Substance | mppcf (a) | mg/m ³ |
| Silica: | | |
| Crystalline | | |
| Quartz (respirable) | | 0.1 mg/m ³ |
| Quartz (total dust) | | $\frac{30 \text{ mg/m}^{3(e)}}{\% \text{SiO}_2 + 2}$ |
| Cristobalite (respirable) | | 0.05 mg/m ³ |
| Tridymite: Use 1/2 the value calculated from the formulae for quartz. | | |
| Amorphous, including natural diatomaceous earth | 20 | $\frac{80 \text{ mg/m}^{3(e)}}{\% \text{SiO}_2}$ |
| Silicates (less than 1% crystalline silica): | | |
| Mica | 20 | |
| Soapstone..... | 20 | |
| Talc (not containing asbestos) | 20 ^(c) | |
| Talc (containing asbestos) Use asbestos limit. | 20 | |
| Tremolite, asbestiform (see OAR 437, Div. 2/Z, 1910.1001, Asbestos). | | |
| Portland cement..... | 50 | |
| Graphite (Natural) | | 5 mg/m ³ |
| Coal Dust: | | |
| Respirable fraction less than 5% SiO ₂ | | 2.4 mg/m ^{3(e) (f)} |
| Respirable fraction greater than 5% SiO ₂ | | 0.1 mg/m ^{3 (e)} |
| Inert or Nuisance Dust: ^(d) | | |
| Respirable fraction | | 5 mg/m³ |
| Total dust | | 10 mg/m³ |

NOTE: Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal limits.

NOTE: Conversion factors - mppcf x 35.3 = million particles per cubic meter = particles per c.c.

FOOTNOTES:

- (a) Millions of particles per cubic foot of air, based on impinger samples counted by light-field techniques.
- (b) The percentage of crystalline silica in the formula is the amount determined from airborne samples, except in those instances in which other methods have been shown to be applicable.
- (c) Containing less than 1% quartz; if 1% quartz or more, use quartz limit.

- (d) All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Oregon Table Z-1.
- (e) Silica sampling methods must conform to OSHA or NIOSH sampling methods for respirable quartz silica.
- (f) The measurements under this note refer to the use of an AEC (now NRC) instrument. If the respirable fraction of coal dust is determined with a MRE the figure corresponding to that of 2.4 mg/m³ in the table for coal dust is 4.5 mg/m³.

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

Stats. Implemented: ORS 654.001 through 654.295.

Hist: WCB Admin. Order, Safety 3-1975, f. 10/6/75, ef. 11/1/75.
WCB Admin. Order, Safety 6-1978, f. 7/5/78, ef. 7/15/78.
WCD Admin. Order, Safety 12-1979, f. 12/21/79, ef. 3/1/80.
WCB Admin. Order, Safety 2-1980, f. 4/17/80, ef. 8/1/80.
WCB Admin. Order, Safety 1-1982, f. 3/4/82, ef. 5/5/82.
WCB Admin. Order, Safety 6-1983, f. 5/25/83, ef. 5/25/83.
WCB Admin. Order, Safety 21-1984, f. 12/20/84, ef. 1/1/85.
WCD Admin. Order, Safety 4-1986, f. 5/5/86, ef. 5/5/86.
WCB Admin. Order, Safety 5-1986, f. 5/20/86, ef. 6/13/86.
APD Admin. Order, Safety 13-1989, f. 7/17/89, ef. 7/17/89.
OR-OSHA Admin. Order 6-1993, f. 5/17/93, ef. 5/17/93 (temp).
OR-OSHA Admin. Order 17-1993, f. 11/15/93, ef. 11/15/93 (perm).
OR-OSHA Admin. Order 5-1997, f. 4/22/97, ef. 4/22/97.
OR-OSHA Admin. Order 6-1997, f. 5/2/97, ef. 5/2/97.
OR-OSHA Admin. Order 4-2001, f. 2/5/01, ef. 2/5/01.
OR-OSHA Admin. Order 6-2006, f. 8/30/06, ef. 8/30/06.
OR-OSHA Admin. Order 6-2008, f. 5/13/08, ef. 7/1/08.

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