

**DEPARTMENT OF LABOR AND ECONOMIC OPPORTUNITY**

**DIRECTOR'S OFFICE**

**GENERAL INDUSTRY SAFETY AND HEALTH STANDARD**

(By authority conferred on the director of the department of labor and economic opportunity by sections 14, 16, 19, 21, and 24 of the Michigan occupational safety and health act, 1974 PA 154, MCL 408.1014, 408.1016, 408.1019, 408.1021, and 408.1024, and Executive Reorganization Order Nos. 1996-1, 1996-2, 2003-1, 2008-4, 2011-4, and 2019-3, MCL 330.3101, 445.2001, 445.2011, 445.2025, 445.2030, and 125.1998)

**PART 301. AIR CONTAMINANTS FOR GENERAL INDUSTRY**

**R 325.51101 Scope, application, and availability of standards.**

Rule 1. (1) These rules do not apply to the following types of employment:

- (a) Agriculture.
- (b) Domestic.
- (c) Mining.
- (d) Construction.

(2) Exposure to air contaminants in construction work is covered by Construction Safety and Health Standard Part 601. "Air Contaminants for Construction."

(3) The following Michigan Occupational Safety and Health Administration (MIOSHA) standards are referenced in these rules. Up to 5 copies of these standards may be obtained at no charge from the Michigan Department of Labor and Economic Opportunity, MIOSHA Regulatory Services Section, 530 West Allegan Street, P.O. Box 30643, Lansing, Michigan, 48909-8143 or via the internet at the following website: [www.michigan.gov/mioshastandards](http://www.michigan.gov/mioshastandards). For quantities greater than 5, the cost, as of the time of adoption of these rules, is 4 cents per page.

(a) General Industry Safety and Health Standard Part 302. "Vinyl Chloride," R 325.51401 to R 325.51414.

(b) General Industry Safety and Health Standard Part 303. "Methylenedianiline (MDA) in General Industry," R 325.50051 to R 325.50076.

(c) General Industry and Construction Safety and Health Standard Part 304. "Ethylene Oxide," R 325.51151 to R 325.51177.

(d) Occupational Health Standard Part 305. "Asbestos for General Industry," R 325.51311 to R 325.51312.

(e) General Industry and Construction Safety and Health Standard Part 306. "Formaldehyde," R 325.51451 to R 325.51477.

(f) General Industry and Construction Safety and Health Standard Part 307. "Acrylonitrile," R 325.51501 to R 325.51527.

(g) General Industry and Construction Safety and Health Standard Part 308. "Inorganic Arsenic," R 325.51601 to R 325.51628.

(h) General Industry Safety and Health Standard Part 309. "Cadmium in General Industry," R 325.51851 to R 325.51886.

(i) General Industry Safety and Health Standard Part 310. "Lead in General Industry," R 325.51901 to R 325.51958.

(j) General Industry and Construction Safety and Health Standard Part 311. "Benzene," R 325.77101 to R 325.77115.

(k) Occupational Health Standard Part 312. "1,3-Butadiene," R 325.50091 to R 325.50093.

(l) Occupational Health Standard Part 313. "Methylene Chloride," R 325.51651 to R 325.51653.

(m) General Industry and Construction Safety and Health Standard Part 314. "Coke Oven Emissions," R 325.50100 to R 325.50136.

(n) Occupational Health Standard Part 315. "Chromium (VI) in General Industry," R 325.50141 to R 325.50143.

(o) General Industry Safety and Health Standard Part 340. "Beryllium," R 325.34001 to R 325.34010.

(p) General Industry Safety and Health Standard Part 350. "Carcinogens," R 325.35001 to R 325.35011.

(q) Occupational Health Standard Part 451. "Respiratory Protection," R 325.60051 to R 325.60052.

(r) General Industry Safety and Health Standard Part 590. "Silica in General Industry," R 325.59001 to R 325.59015.

(s) Construction Safety and Health Standard Part 601. "Air Contaminants for Construction," R 325.60151 to R 325.60161.

History: 1990 AACCS; 2013 AACCS; 2017 AACCS; 2019 AACCS.

### **R 325.51101a Rescinded.**

History: 2013 AACCS; 2017 AACCS; 2019 AACCS.

### **R 325.51102 Definitions.**

Rule 2. (1) "Ceiling" means the employee's exposure that shall not be exceeded during any part of the workday. If instantaneous monitoring is not feasible, then the ceiling shall be assessed as a 15-minute, time-weighted average exposure that shall not be exceeded during any part of the working day.

(2) "Skin designation" means those substances so indicated that have toxic effects due to absorption through an employee's skin.

(3) "Short-term exposure limit (STEL)" means the employee's 15-minute, time-weighted average exposure that shall not be exceeded at any time during a workday, unless another time limit is specified in a parenthetical notation below the limit. If another time period is specified, then the time-weighted average exposure over that time limit shall not be exceeded at any time during the workday.

(4) "Time-weighted average (TWA)" means the employee's average airborne exposure in any 8-hour workshift of a 40-hour workweek that shall not be exceeded.

(5) The terms "substance" and "air contaminant" are equivalent in meaning for purposes of these rules.

History: 1990 AACCS; 2001 AACCS; 2017 AACCS.

### **R 325.51103 Exposure limits.**

Rule 3. An employer shall ensure that an employee exposure to any substance listed in tables G-1-A or G-2 in R 325.51108 is limited in accordance with the requirements of all of the following provisions:

(a) With respect to table G-1-A, all of the following provisions apply:

(i) Removed (May 9, 2001).

(ii) Removed (May 20, 2001).

(iii) An employee's exposure to any substance listed in table G-1-A shall not exceed the time-weighted average (TWA) limit, short-term exposure limit (STEL) and ceiling limit specified for that substance in table G-1-A.

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

(v) An employee shall not be exposed to air concentrations between the TWA and STEL limits more than 4 times in a workshift and such exposures shall be no less than 60 minutes apart.

(b) With respect to table G-2, all of the following provisions apply:

(i) An employee's exposure to any substance listed in table G-2 in any 8-hour workshift of a 40-hour workweek shall not exceed the 8-hour, time-weighted average limit given for that substance in table G-2.

(ii) An employee's exposure to a substance listed in table G-2 shall not exceed, at any time during an 8-hour workshift, the acceptable ceiling concentration limit given for the substance in the table, except for a period of time and up to a concentration that does not exceed the maximum duration and concentration allowed in the column under "Acceptable maximum peak above the ceiling concentration for an 8-hour workshift." For example, during an 8-hour workshift, an employee may be exposed to a concentration of Substance A (with a 10 parts of the substance per million parts of air (ppm) TWA, 25 ppm ceiling and 50 ppm peak) above 25 ppm (but not above 50 ppm) only for a maximum period of 10 minutes. Such an exposure shall be compensated for by exposures to concentrations less than 10 ppm so the cumulative exposure for the entire 8-hour workshift does not exceed a time-weighted average of 10 ppm.

(iii) If a substance is preceded by an "S", then an employer shall take the necessary precautions to prevent an employee from absorbing the substance through his or her skin.

History: 1990 AACCS; 2001 AACCS; 2017 AACCS.

### **R 325.51104 Computation formulae.**

Rule 4. The computation formulas that apply to employee exposure to 1 or more substances that have an 8-hour, time-weighted average listed in table G-1-A or G-2 to determine whether an employee is exposed in excess of the exposure limit are as follows:

(a) An employer shall compute the cumulative exposure for multiple exposures to a single substance for an 8-hour workshift as follows:

$$E = (C_1T_1 + C_2T_2 + \dots C_nT_n) \div 8 \text{ hours}$$

Where:

E is the cumulative exposure for an 8-hour workshift.

C<sub>1</sub> is the substance concentration during the first period of time "T" where the concentration remains constant.

C<sub>2</sub> is the substance concentration during the second period of time "T" where the concentration remains constant.

T is the period of time in hours for which the substance concentration C remains constant.

The value of E shall not exceed the 8-hour, time-weighted average limit for the substance as specified in table G-1-A or G-2.

To illustrate the formula for a cumulative exposure to a single substance, assume that Substance A has an 8-hour, time-weighted average exposure limit of 100 ppm noted in table G-1-A. Assume that an employee is subject to the following exposures over an 8-hour workshift:

Two hours' exposure at 150 ppm

Two hours' exposure at 75 ppm

Four hours' exposure at 50 ppm

Substituting this information into the formula:

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

$$E = [300 \text{ ppm}\cdot\text{hrs} + 150 \text{ ppm}\cdot\text{hrs} + 200 \text{ ppm}\cdot\text{hrs}] \div 8 \text{ hrs}$$

$$E = 650 \text{ ppm}\cdot\text{hrs} \div 8 \text{ hrs} = 81.25 \text{ ppm}$$

Since the cumulative exposure of 81.25 ppm is less than the exposure limit of 100 ppm, then the employee's 8-hour workshift exposure is acceptable.

(b) An employer shall compute the equivalent exposure for a mixture of air contaminants for an 8-hour workshift as follows:

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

Where:

E<sub>m</sub> is the equivalent exposure to the mixture of air contaminants during an 8-hour workshift.

C<sub>1</sub> is the average 8-hour concentration of the first substance.

C<sub>2</sub> is the average 8-hour concentration of the second substance.

L is the 8-hour, TWA exposure limit for that particular substance. The value of Em shall not exceed a value of one (1.0).

To illustrate the formula for a mixture of air contaminants, assume the following exposures:

| Substances in mixture | Average concentration of 8-hour exposure (C) | 8-hour TWA exposure limit (L) |
|-----------------------|--|-------------------------------|
| Substance A           | 500 ppm                                      | 1,000 ppm                     |
| Substance B           | 45 ppm                                       | 200 ppm                       |
| Substance D           | 40 ppm                                       | 200 ppm                       |

Substituting this information into the formula:

$$EM = (500 \text{ ppm} \div 1,000 \text{ ppm}) + (45 \text{ ppm} \div 200 \text{ ppm}) + (40 \text{ ppm} \div 200 \text{ ppm})$$

$$Em = 0.500 + 0.225 + 0.200$$

$$Em = 0.925$$

Since the value of Em did not exceed one (1.0), the employee's 8-hour workshift exposure to the mixture of air contaminants is acceptable.

History: 1990 AACCS; 2001 AACCS; 2017 AACCS.

### **R 325.51105 Methods of compliance.**

Rule 5. To achieve compliance with the provisions of R 325.51103 and R 325.51104, administrative or engineering controls must first be determined and implemented if feasible. If such controls are not feasible to achieve full compliance, then personal protective equipment or any other protective measures must be used to keep the employee's exposure to air contaminants within the exposure limits prescribed in these rules. Any equipment and technical measures used for this purpose must be approved for each particular use by a competent industrial hygienist or other technically qualified person. If a respirator is used, its use must comply with the provisions of Occupational Health Standard Part 451. "Respiratory Protection."

History: 1990 AACCS; 2001 AACCS; 2013 AACCS; 2019 AACCS.

### **R 325.51106 Rescinded.**

History: 1990 AACCS; 2001 AACCS.

**R 325.51107 Stay of enforcement.**

Rule 7. Enforcement of the limits are indefinitely stayed for the following substances until the United States department of labor, occupational safety and health administration (OSHA) publishes in the Federal Register a notice that a sampling and analytical technique is available:

- (a) Aluminum alkyls.
- (b) Ethylidene norbornene.
- (c) Hexafluoroacetone.
- (d) Mercury (alkyl compounds).
- (e) Oxygen difluoride.
- (f) Phenylphosphine.
- (g) Sulfur pentafluoride.

History: 1990 AACCS.

**R 325.51108 Tables.**

Rule 8. Tables G-1-A and G-2 read as follows:

| TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS                   |                      |                  |                    |                   |                    |                  |                    |                  |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
| Substance   | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Abate   |                      | –                | 15                 | –                 | –                  | –                | –                  | –                |
| Acetaldehyde  | 75-07-0              | 100              | 180                | 150               | 270                | –                | –                  | –                |
| Acetic acid   | 64-19-7              | 10               | 25                 | –                 | –                  | –                | –                  | –                |
| Acetic anhydride  | 108-24-7             | –                | –                  | –                 | –                  | 5                | 20                 | –                |
| Acetone   | 67-64-1              | 750              | 1800               | 1000              | 2400               | –                | –                  | –                |
| Acetonitrile  | 75-05-8              | 40               | 70                 | 60                | 105                | –                | –                  | –                |
| 2-Acetylaminofluorine; see GI Part 350.<br>Carcinogens <sup>F</sup> | 53-96-3              |                  |                    |                   |                    |                  |                    |                  |
| Acetylene dichloride; see 1,2-Dichloroethylene                      |                      |                  |                    |                   |                    |                  |                    |                  |
| Acetylene tetrabromide  | 79-27-6              | 1                | 14                 | –                 | –                  | –                | –                  | –                |
| Acetylsalicylic acid (Aspirin)                                      | 50-78-2              | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Acrolein  | 107-02-8             | 0.1              | 0.25               | 0.3               | 0.8                | –                | –                  | –                |
| Acrylamide  | 79-06-1              | –                | 0.03               | –                 | –                  | –                | –                  | x                |
| Acrylic acid  | 79-10-7              | 10               | 30                 | –                 | –                  | –                | –                  | x                |
| Acrylonitrile; see GI & CS Part 307. Acrylonitrile <sup>F</sup>     | 107-13-1             | 2                | 4.34               | 10                | 21.7               |                  |                    |                  |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance  | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|--|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|  |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Aldrin   | 309-00-2             | –                | 0.25               | –                 | –                  | –                | –                  | x                |
| Allyl alcohol  | 107-18-6             | 2                | 5                  | 4                 | 10                 | –                | –                  | x                |
| Allyl chloride   | 107-05-1             | 1                | 3                  | 2                 | 6                  | –                | –                  | –                |
| Allyl glycidyl ether (AGE)                                 | 106-92-3             | 5                | 22                 | 10                | 44                 | –                | –                  | –                |
| Allyl propyl disulfide                                     | 2179-59-1            | 2                | 12                 | 3                 | 18                 | –                | –                  | –                |
| □ α Alumina (aluminum oxide)                               |                      |                  |                    |                   |                    |                  |                    |                  |
| Respirable fraction  | 1344-28-1            | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Total dust   |                      | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Aluminum (as Al)   |                      |                  |                    |                   |                    |                  |                    |                  |
| Alkyls   |                      | –                | 2                  | –                 | –                  | –                | –                  | –                |
| Metal  |                      | –                | –                  | –                 | –                  | –                | –                  | –                |
| Respirable dust  | 7429-90-5            | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Total dust   |                      | –                | 15                 | –                 | –                  | –                | –                  | –                |
| Pyro powders   |                      | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Soluble salts  |                      | –                | 2                  | –                 | –                  | –                | –                  | –                |
| Welding fumes*   |                      | –                | 5                  | –                 | –                  | –                | –                  | –                |
| 4-Aminodiphenyl; see GI Part 350. Carcinogens <sup>F</sup> | 92-67-1              |                  |                    |                   |                    |                  |                    |                  |
| 2-Aminoethanol; see Ethanolamine                           |                      |                  |                    |                   |                    |                  |                    |                  |
| 2-Aminopyridine  | 504-29-0             | 0.5              | 2                  | –                 | –                  | –                | –                  | –                |
| Amitrole   | 61-82-5              | –                | 0.2                | –                 | –                  | –                | –                  | –                |
| Ammonia  | 7664-41-7            | –                | –                  | 35                | 24                 | –                | –                  | –                |



TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance  | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|--|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|  |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Ammonium chloride fume   | 12125-02-9           | –                | 10                 | –                 | 20                 | –                | –                  | –                |
| Ammonium sulfamate   | 7773-06-0            | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Respirable dust  |                      | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Total dust   |                      |                  |                    |                   |                    |                  |                    |                  |
| n-Amyl acetate   | 628-63-7             | 100              | 525                | –                 | –                  | –                | –                  | –                |
| sec-Amyl acetate   | 626-38-0             | 125              | 650                | –                 | –                  | –                | –                  | –                |
| Aniline and homologues   | 62-53-3              | 2                | 8                  | –                 | –                  | –                | –                  | x                |
| Anisidine (o- and p-isomers)   | 29191-52-4           | –                | 0.5                | –                 | –                  | –                | –                  | x                |
| Antimony and compounds (as Sb)   | 7440-36-0            | –                | 0.5                | –                 | –                  | –                | –                  | –                |
| ANTU (alpha-naphthylthiourea)  | 86-88-4              | –                | 0.3                | –                 | –                  | –                | –                  | –                |
| Arsenic, organic compounds (as As)   | 7440-38-2            | –                | 0.5                | –                 | –                  | –                | –                  | –                |
| Arsenic, inorganic compounds (as As); see GI & CS Part 308. Inorganic Arsenic <sup>F</sup> | 7440-38-2            |                  | 0.01               |                   |                    |                  |                    |                  |
| Arsine   | 7784-42-1            | 0.05             | 0.2                | –                 | –                  | –                | –                  | –                |
|  |                      |                  |                    |                   |                    |                  |                    |                  |
|  |                      |                  |                    |                   |                    |                  |                    |                  |
| Asbestos; see OH Part 305. Asbestos for General Industry <sup>F</sup>                      | Varies               |                  | 0.1f/cc            |                   | –                  |                  |                    |                  |
|  |                      |                  |                    |                   |                    |                  |                    |                  |
|  |                      |                  |                    |                   |                    |                  |                    |                  |
|  |                      |                  |                    |                   |                    |                  |                    |                  |
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|  |                      |                  |                    |                   |                    |                  |                    |                  |
|  |                      |                  |                    |                   |                    |                  |                    |                  |
|  |                      |                  |                    |                   |                    |                  |                    |                  |
| Atrazine   | 1912-24-9            | –                | 5                  | –                 | –                  | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup> | TWA              |                                    | STEL <sup>D</sup> |                                   | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|------------------------------------|-------------------|-----------------------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup>                 | ppm <sup>B</sup>  | mg/m <sup>3C</sup>                | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Azinphos-methyl   | 86-50-0              | –                | 0.2                                | –                 | –                                 | –                | –                  | x                |
| Barium, soluble compounds (as Ba)   | 7440-39-3            | –                | 0.5                                | –                 | –                                 | –                | –                  | –                |
| Barium sulfate  | 7727-43-7            | –                | 5                                  | –                 | –                                 | –                | –                  | –                |
| Respirable dust   |                      | –                | 10                                 | –                 | –                                 | –                | –                  | –                |
| Benomyl   | 17804-35-2           | –                | 5                                  | –                 | –                                 | –                | –                  | –                |
| Respirable dust   |                      | –                | 10                                 | –                 | –                                 | –                | –                  | –                |
| Benzene <sup>E</sup> ; see GI & CS Part 311. Benzene <sup>F</sup> and table G-2 for limits applicable in the operations or sectors excluded in R 325.77101 <sup>E</sup> | 71-43-2              | 1                | 3.19                               | 5                 | 15.97                             |                  |                    |                  |
| Benzidine; see GI Part 350. Carcinogens <sup>F</sup>  | 92-87-5              |                  |                                    |                   |                                   |                  |                    |                  |
| p-Benzoquinone; see Quinone   |                      |                  |                                    |                   |                                   |                  |                    |                  |
| Benzo(a)pyrene; see Coal tar pitch volatiles  |                      |                  |                                    |                   |                                   |                  |                    |                  |
| Benzoyl peroxide  | 94-36-0              | –                | 5                                  | –                 | –                                 | –                | –                  | –                |
| Benzyl chloride   | 100-44-7             | 1                | 5                                  | –                 | –                                 | –                | –                  | –                |
| Beryllium and beryllium compounds (as Be) see GI Part 340. Beryllium  | 7440-41-7            | –                | 0.0002<br>(0.2 µg/m <sup>3</sup> ) | –                 | 0.002<br>(2.0 µg/m <sup>3</sup> ) | –                | –                  | –                |
|   |                      |                  |                                    |                   |                                   |                  |                    |                  |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance  | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|--|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|  |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Biphenyl; see Diphenyl                                     |                      |                  |                    |                   |                    |                  |                    |                  |
| Bismuth telluride, Undoped                                 | 1304-82-1            | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Respirable dust  |                      | –                | 15                 | –                 | –                  | –                | –                  | –                |
| Total dust   |                      |                  |                    |                   |                    |                  |                    |                  |
| Bismuth telluride, Se-doped                                |                      | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Borates, Tetra, Sodium Salts                               |                      |                  |                    |                   |                    |                  |                    |                  |
| Anhydrous  | 1330-43-4            | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Decahydrate  | 1303-96-4            | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Pentahydrate   | 12179-04-3           | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Boron oxide, Total dust                                    | 1303-86-2            | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Boron tribromide   | 10294-33-4           | –                | –                  | –                 | –                  | 1                | 10                 | –                |
| Boron trifluoride  | 7637-07-2            | –                | –                  | –                 | –                  | 1                | 3                  | –                |
| Bromacil   | 314-40-9             | 1                | 10                 | –                 | –                  | –                | –                  | –                |
| Bromine  | 7726-95-6            | 0.1              | 0.7                | 0.3               | 2                  | –                | –                  | –                |
| Bromine pentafluoride                                      | 7789-30-2            | 0.1              | 0.7                | –                 | –                  | –                | –                  | –                |
| Bromoform  | 75-25-2              | 0.5              | 5                  | –                 | –                  | –                | –                  | –                |
| 1,3-Butadiene; see OH Part 312. 1,3-Butadiene <sup>F</sup> | 106-99-0             | 1                | 2.2                | 5                 | 11.1               | –                | –                  | –                |
| Butane   | 106-97-8             | 800              | 1900               | –                 | –                  | –                | –                  | –                |
| Butanethiol; see Butyl mercaptan                           |                      |                  |                    |                   |                    |                  |                    |                  |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup> | TWA              |                                 | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|---------------------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup>              | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| 2-Butanone (Methyl ethyl ketone)  | 78-93-3              | 200              | 590                             | 300               | 885                | –                | –                  | –                |
| 2-Butoxyethanol   | 111-76-2             | 25               | 120                             | –                 | –                  | –                | –                  | x                |
| n-Butyl acetate   | 123-86-4             | 150              | 710                             | 200               | 950                | –                | –                  | –                |
| sec-Butyl acetate   | 105-46-4             | 200              | 950                             | –                 | –                  | –                | –                  | –                |
| tert-Butyl acetate  | 540-88-5             | 200              | 950                             | –                 | –                  | –                | –                  | –                |
| Butyl acrylate  | 141-32-2             | 10               | 55                              | –                 | –                  | –                | –                  | –                |
| n-Butyl alcohol (n-butanol)   | 71-36-3              | –                | –                               | –                 | –                  | 50               | 150                | x                |
| sec-Butyl alcohol (sec-butanol)   | 78-92-2              | 100              | 305                             | –                 | –                  | –                | –                  | –                |
| tert-Butyl alcohol (tert-butanol)   | 75-65-0              | 100              | 300                             | 150               | 450                | –                | –                  | –                |
| Butylamine  | 109-73-9             | –                | –                               | –                 | –                  | 5                | 15                 | x                |
| tert-Butyl chromate (as Cr+6); see OH Part 315.<br>Chromium (VI) in General Industry <sup>F,G</sup> | 1189-85-1            | –                | 0.005<br>(5 µg/m <sup>3</sup> ) | –                 | –                  | –                | –                  | x                |
| n-Butyl glycidyl ether (BGE)  | 2426-08-6            | 25               | 135                             | –                 | –                  | –                | –                  | –                |
| n-Butyl lactate   | 138-22-7             | 5                | 25                              | –                 | –                  | –                | –                  | –                |
| Butyl mercaptan   | 109-79-5             | 0.5              | 1.5                             | –                 | –                  | –                | –                  | –                |
| o-sec-Butylphenol   | 89-72-5              | 5                | 30                              | –                 | –                  | –                | –                  | x                |
| p-tert-Butyltoluene   | 98-51-1              | 10               | 60                              | 20                | 120                | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance  | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|--|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|  |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Cadmium; see GI Part 309. Cadmium in General Industry <sup>F</sup> | 7440-43-9            | –                | 0.005              | –                 | –                  | –                | –                  | –                |
| Calcium carbonate,<br>Respirable dust<br>Total dust                | 1317-65-3            | –<br>–           | 5<br>15            | –<br>–            | –<br>–             | –<br>–           | –<br>–             | –<br>–           |
| Calcium cyanamide  | 156-62-7             | –                | 0.5                | –                 | –                  | –                | –                  | –                |
| Calcium hydroxide  | 1305-62-0            | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Calcium oxide  | 1305-78-8            | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Calcium silicate,<br>Respirable dust<br>Total dust                 | 1344-95-2            | –<br>–           | 5<br>15            | –<br>–            | –<br>–             | –<br>–           | –<br>–             | –<br>–           |
| Calcium sulfate,<br>Respirable dust<br>Total dust                  | 7778-18-9            | –<br>–           | 5<br>15            | –<br>–            | –<br>–             | –<br>–           | –<br>–             | –<br>–           |
| Camphor, synthetic   | 76-22-2              | –                | 2                  | –                 | –                  | –                | –                  | –                |
| Caprolactam,<br>Dust<br>Vapor                                      | 105-60-2             | –<br>5           | 1<br>20            | –<br>10           | 3<br>40            | –<br>–           | –<br>–             | –<br>–           |
| Captafol (Difolatan <sup>R</sup> )                                 | 2425-06-1            | –                | 0.1                | –                 | –                  | –                | –                  | –                |
| Captan   | 133-06-2             | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Carbaryl (Sevin <sup>R</sup> )                                     | 63-25-2              | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Carbofuran (Furadan <sup>R</sup> )                                 | 1563-66-2            | –                | 0.1                | –                 | –                  | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance                                   | CAS No. <sup>A</sup>           | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|--------------------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                                | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Carbon black                                | 1333-86-4                      | –                | 3.5                | –                 | –                  | –                | –                  | –                |
| Carbon dioxide                              | 124-38-9                       | 5,000            | 9,000              | 30,000            | 54,000             | –                | –                  | –                |
| Carbon disulfide                            | 75-15-0                        | 4                | 12                 | 12                | 36                 | –                | –                  | x                |
| Carbon monoxide                             | 630-08-0                       | 35               | 40                 | –                 | –                  | 200              | 229                | –                |
| Carbon tetrabromide                         | 558-13-4                       | 0.1              | 1.4                | 0.3               | 4                  | –                | –                  | –                |
| Carbon tetrachloride (Tetrachloromethane)   | 56-23-5                        | 2                | 12.6               | –                 | –                  | –                | –                  | x                |
| Carbonyl fluoride                           | 353-50-4                       | 2                | 5                  | 5                 | 15                 | –                | –                  | –                |
| Catechol (Pyrocatechol)                     | 120-80-9                       | 5                | 20                 | –                 | –                  | –                | –                  | x                |
| Cellulose,<br>Respirable dust<br>Total dust | 9004-34-6                      | –<br>–           | 5<br>15            | –<br>–            | –<br>–             | –<br>–           | –<br>–             | –<br>–           |
| Cesium hydroxide                            | 21351-79-1                     | –                | 2                  | –                 | –                  | –                | –                  | –                |
| Chlordane                                   | 57-74-9                        | –                | 0.5                | –                 | –                  | –                | –                  | x                |
| Chlorinated camphene (Toxaphene)            | 8001-35-2                      | –                | 0.5                | –                 | 1                  | –                | –                  | x                |
| Chlorinated diphenyl oxide                  | 55720-99-5<br>or<br>31242-93-0 | –                | 0.5                | –                 | –                  | –                | –                  | –                |
| Chlorine                                    | 7782-50-5                      | 0.5              | 1.5                | 1                 | 3                  | –                | –                  | –                |
| Chlorine dioxide                            | 10049-04-4                     | 0.1              | 0.3                | 0.3               | 0.9                | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Chlorine trifluoride  | 7790-91-2            | –                | –                  | –                 | –                  | 0.1              | 0.4                | –                |
| Chloroacetaldehyde  | 107-20-0             | –                | –                  | –                 | –                  | 1                | 3                  | –                |
| 2-Chloroacetophenone (Phenacyl chloride)                        | 532-27-4             | 0.5              | 0.3                | –                 | –                  | –                | –                  | –                |
| Chloroacetyl chloride   | 79-04-9              | 0.5              | 0.2                | –                 | –                  | –                | –                  | –                |
| Chlorobenzene   | 108-90-7             | 75               | 350                | –                 | –                  | –                | –                  | –                |
| o-Chlorobenzylidene malononitrile                               | 2698-41-1            | –                | –                  | –                 | –                  | 0.05             | 0.4                | x                |
| Chlorobromomethane  | 74-97-5              | 200              | 1050               | –                 | –                  | –                | –                  | –                |
| 2-Chloro-1,3-butadiene; see β- $\square$ -Chloroprene           |                      |                  |                    |                   |                    |                  |                    |                  |
| Chlorodifluoromethane   | 75-45-6              | 1000             | 3500               | –                 | –                  | –                | –                  | –                |
| Chlorodiphenyl (42% Chlorine) (PCB)                             | 53469-21-9           | –                | 1                  | –                 | –                  | –                | –                  | x                |
| Chlorodiphenyl (54% Chlorine) (PCB)                             | 11097-69-1           | –                | 0.5                | –                 | –                  | –                | –                  | x                |
| 1-Chloro-2,3-epoxy propane; see Epichlorohydrin                 |                      |                  |                    |                   |                    |                  |                    |                  |
| 2-Chloroethanol; see Ethylene chlorohydrin                      |                      |                  |                    |                   |                    |                  |                    |                  |
| Chloroethylene; see Vinyl chloride                              |                      |                  |                    |                   |                    |                  |                    |                  |
| Chloroform (Trichloromethane)                                   | 67-66-3              | 2                | 9.78               | –                 | –                  | –                | –                  | –                |
| bis (Chloromethyl) ether; GI Part 350. Carcinogens <sup>F</sup> | 542-88-1             |                  |                    |                   |                    |                  |                    |                  |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup>    | TWA              |                                 | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|-------------------------|------------------|---------------------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                         | ppm <sup>B</sup> | mg/m <sup>3C</sup>              | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Chloromethyl methyl ether; see GI Part 350.<br>Carcinogens <sup>F</sup>                                       | 107-30-2                |                  |                                 |                   |                    |                  |                    |                  |
| 1-Chloro-1-nitropropane   | 600-25-9                | 4                | 10                              | –                 | –                  | –                | –                  | –                |
| Chloropentafluoroethane   | 76-15-3                 | 1000             | 6320                            | –                 | –                  | –                | –                  | –                |
| Chloropicrin  | 76-06-2                 | 0.1              | 0.7                             | –                 | –                  | –                | –                  | –                |
| beta-Chloroprene  | 126-99-8                | 10               | 35                              | –                 | –                  | –                | –                  | x                |
| o-Chlorostyrene   | 2039-87-4               | 50               | 285                             | 75                | 428                | –                | –                  | –                |
| o-Chlorotoluene   | 95-49-8                 | 50               | 250                             | –                 | –                  | –                | –                  | –                |
| 2-Chloro-6-(trichloromethyl) pyridine,<br>Respirable dust<br>Total dust                                       | 1929-82-4               | –<br>–           | 5<br>15                         | –<br>–            | –<br>–             | –<br>–           | –<br>–             | –<br>–           |
| Chlorpyrifos  | 2921-88-2               | –                | 0.2                             | –                 | –                  | –                | –                  | x                |
| Chromic acid and chromates (as Cr+6); see OH<br>Part 315. Chromium (VI) in General<br>Industry <sup>F,G</sup> | Varies with<br>compound | –                | 0.005<br>(5 µg/m <sup>3</sup> ) | –                 | –                  | –                | –                  | –                |
| Chromium (II) compounds (as Cr)   | 7440-47-3               | –                | 0.5                             | –                 | –                  | –                | –                  | –                |
| Chromium (III) compounds (as Cr)  | 7440-47-3               | –                | 0.5                             | –                 | –                  | –                | –                  | –                |
| Chromium (VI) compounds; see OH Part 315.<br>Chromium (VI) in General Industry <sup>F,G</sup>                 | Varies with<br>compound |                  | (5 µg/m <sup>3</sup> )          |                   |                    |                  |                    |                  |
| Chromium metal (as Cr)  | 7440-47-3               | –                | 1                               | –                 | –                  | –                | –                  | –                |



TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup> | TWA              |                                  | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|----------------------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup>               | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Chrysene; see Coal tar pitch volatile   |                      |                  |                                  |                   |                    |                  |                    |                  |
| Clopidol  |                      |                  |                                  |                   |                    |                  |                    |                  |
| Respirable dust   | 2971-90-6            | –                | 5                                | –                 | –                  | –                | –                  | –                |
| Total dust  |                      | –                | 15                               | –                 | –                  | –                | –                  | –                |
| Coal dust (less than 5% SiO <sub>2</sub> ) Respirable dust  | –                    | –                | 2                                | –                 | –                  | –                | –                  | –                |
| Coal dust (greater than or equal to 5% SiO <sub>2</sub> ), Respirable dust                              | –                    | –                | 0.1                              | –                 | –                  | –                | –                  | –                |
| Coal tar pitch volatile (as benzene solubles) anthracene, BaP, phenanthrene, acridine, chrysene, pyrene | 65996-93-2           | –                | 0.2                              | –                 | –                  | –                | –                  | –                |
| Cobalt metal, dust, and fume (as Co)  | 7440-48-4            | –                | 0.05                             | –                 | –                  | –                | –                  | –                |
| Cobalt carbonyl (as Co)   | 10210-68-1           | –                | 0.1                              | –                 | –                  | –                | –                  | –                |
| Cobalt hydrocarbonyl (as Co)  | 16842-03-8           | –                | 0.1                              | –                 | –                  | –                | –                  | –                |
| Coke oven emissions; see GI & CS Part 314. Coke Oven Emissions <sup>F</sup>                             | –                    | –                | 0.15<br>(150 µg/m <sup>3</sup> ) | –                 | –                  | –                | –                  | –                |
| Copper,   |                      |                  |                                  |                   |                    |                  |                    |                  |
| Dusts and mists (as Cu)   | 7440-50-8            | –                | 1                                | –                 | –                  | –                | –                  | –                |
| Fume (as Cu)  |                      | –                | 0.1                              | –                 | –                  | –                | –                  | –                |
| Cotton dust (raw)   | –                    | –                | 1                                | –                 | –                  | –                | –                  | –                |
| Crag herbicide (Sesone)   |                      |                  |                                  |                   |                    |                  |                    |                  |
| Total dust  | 136-78-7             | –                | 10                               | –                 | –                  | –                | –                  | –                |
| Respirable fraction   |                      | –                | 5                                | –                 | –                  | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance           | CAS No. <sup>A</sup>  | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---------------------|-----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|                     |                       | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Cresol, all isomers | 1319-77-3             | 5                | 22                 | –                 | –                  | –                | –                  | x                |
| Crotonaldehyde      | 123-73-9<br>4170-30-3 | 2                | 6                  | –                 | –                  | –                | –                  | –                |
| Crufomate           | 299-86-5              | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Cumene              | 98-82-8               | 50               | 245                | –                 | –                  | –                | –                  | x                |
| Cyanamide           | 420-04-2              | –                | 2                  | –                 | –                  | –                | –                  | –                |
| Cyanides (as CN)    | Varies with compound  | –                | 5                  | –                 | –                  | –                | –                  | x                |
| Cyanogen            | 460-19-5              | 10               | 20                 | –                 | –                  | –                | –                  | –                |
| Cyanogen chloride   | 506-77-4              | –                | –                  | –                 | –                  | 0.3              | 0.6                | –                |
| Cyclohexane         | 110-82-7              | 300              | 1050               | –                 | –                  | –                | –                  | –                |
| Cyclohexanol        | 108-93-0              | 50               | 200                | –                 | –                  | –                | –                  | x                |
| Cyclohexanone       | 108-94-1              | 25               | 100                | –                 | –                  | –                | –                  | x                |
| Cyclohexene         | 110-83-8              | 300              | 1015               | –                 | –                  | –                | –                  | –                |
| Cyclohexylamine     | 108-91-8              | 10               | 40                 | –                 | –                  | –                | –                  | –                |
| Cyclonite           | 121-82-4              | –                | 1.5                | –                 | –                  | –                | –                  | x                |
| Cyclopentadiene     | 542-92-7              | 75               | 200                | –                 | –                  | –                | –                  | –                |
| Cyclopentane        | 287-92-3              | 600              | 1720               | –                 | –                  | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance  | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|--|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|  |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Cyhexatin  | 13121-70-5           | –                | 5                  | –                 | –                  | –                | –                  | –                |
| 2,4-D (Dichlorophenoxyacetic acid)                                   | 94-75-7              | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Decaborane   | 17702-41-9           | 0.05             | 0.3                | 0.15              | 0.9                | –                | –                  | x                |
| Demeton (Systox <sup>R</sup> )                                       | 8065-48-3            | –                | 0.1                | –                 | –                  | –                | –                  | x                |
| Diacetone alcohol<br>(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                | –                 | –                  | –                | –                  | –                |
| 2-N-Dibutylaminoethanol  | 102-81-8             | 2                | 14                 | –                 | –                  | –                | –                  | –                |
| Dibutyl phosphate  | 107-66-4             | 1                | 5                  | 2                 | 10                 | –                | –                  | –                |
| Dibutyl phthalate  | 84-74-2              | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Dichloroacetylene  | 7572-29-4            | –                | –                  | –                 | –                  | 0.1              | 0.4                | –                |
| o-Dichlorobenzene  | 95-50-1              | –                | –                  | –                 | –                  | 50               | 300                | –                |
| p-Dichlorobenzene  | 106-46-7             | 75               | 450                | 110               | 675                | –                | –                  | –                |
| 3,3'-Dichlorobenzidine; see GI Part 350.<br>Carcinogens <sup>F</sup> | 91-94-1              |                  |                    |                   |                    |                  |                    |                  |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance                                     | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Dichlorodifluoromethane                       | 75-71-8              | 1000             | 4950               | –                 | –                  | –                | –                  | –                |
| 1,3-Dichloro-5,5-dimethyl hydantoin           | 118-52-5             | –                | 0.2                | –                 | 0.4                | –                | –                  | –                |
| Dichlorodiphenyltri-chloroethane (DDT)        | 50-29-3              | –                | 1                  | –                 | –                  | –                | –                  | x                |
| 1,1-Dichloroethane                            | 75-34-3              | 100              | 400                | –                 | –                  | –                | –                  | –                |
| 1,2-Dichloroethylene                          | 540-59-0             | 200              | 790                | –                 | –                  | –                | –                  | –                |
| Dichloroethyl ether                           | 111-44-4             | 5                | 30                 | 10                | 60                 | –                | –                  | x                |
| Dichlorofluoromethane                         | 75-43-4              | 10               | 40                 | –                 | –                  | –                | –                  | –                |
| Dichloromethane; see Methylene chloride       |                      |                  |                    |                   |                    |                  |                    |                  |
| 1,1-Dichloro-1-nitroethane                    | 594-72-9             | 2                | 10                 | –                 | –                  | –                | –                  | –                |
| 1,2-Dichloropropane; see Propylene dichloride |                      |                  |                    |                   |                    |                  |                    |                  |
| 1,3-Dichloropropene                           | 542-75-6             | 1                | 5                  | –                 | –                  | –                | –                  | x                |
| 2,2-Dichloropropionic acid                    | 75-99-0              | 1                | 6                  | –                 | –                  | –                | –                  | –                |
| Dichlorotetrafluoroethane                     | 76-14-2              | 1000             | 7000               | –                 | –                  | –                | –                  | –                |
| Dichlorvos (DDVP)                             | 62-73-7              | –                | 1                  | –                 | –                  | –                | –                  | x                |
| Dicrotophos                                   | 141-66-2             | –                | 0.25               | –                 | –                  | –                | –                  | x                |
| Dicyclopentadiene                             | 77-73-6              | 5                | 30                 | –                 | –                  | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Dicyclopentadienyl iron,<br>Respirable dust<br>Total dust               | 102-54-5             | –                | 5<br>10            | –                 | –                  | –                | –                  | –                |
| Dieldrin  | 60-57-1              | –                | 0.25               | –                 | –                  | –                | –                  | x                |
| Diethanolamine  | 111-42-2             | 3                | 15                 | –                 | –                  | –                | –                  | –                |
| Diethylamine  | 109-89-7             | 10               | 30                 | 25                | 75                 | –                | –                  | –                |
| 2-Diethylaminoethanol   | 100-37-8             | 10               | 50                 | –                 | –                  | –                | –                  | x                |
| Diethylene triamine   | 111-40-0             | 1                | 4                  | –                 | –                  | –                | –                  | x                |
| Diethyl ether; see Ethyl ether  |                      |                  |                    |                   |                    |                  |                    |                  |
| Diethyl ketone  | 96-22-0              | 200              | 705                | –                 | –                  | –                | –                  | –                |
| Diethyl phthalate   | 84-66-2              | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Difluorodibromomethane  | 75-61-6              | 100              | 860                | –                 | –                  | –                | –                  | –                |
| Diglycidyl ether (DGE)  | 2238-07-5            | 0.1              | 0.5                | –                 | –                  | –                | –                  | –                |
| Dihydroxybenzene; see Hydroquinone                                      |                      |                  |                    |                   |                    |                  |                    |                  |
| Diisobutyl ketone   | 108-83-8             | 25               | 150                | –                 | –                  | –                | –                  | –                |
| Diisopropylamine  | 108-18-9             | 5                | 20                 | –                 | –                  | –                | –                  | x                |
| 4-Dimethylaminoazobenzene; see GI Part 350.<br>Carcinogens <sup>F</sup> | 60-11-7              |                  |                    |                   |                    |                  |                    |                  |
| Dimethoxymethane; see Methylal  |                      |                  |                    |                   |                    |                  |                    |                  |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup>            | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|---------------------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                                 | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Dimethyl acetamide  | 127-19-5                        | 10               | 35                 | –                 | –                  | –                | –                  | x                |
| Dimethylamine   | 124-40-3                        | 10               | 18                 | –                 | –                  | –                | –                  | –                |
| Dimethylaminobenzene; see Xylidine                            |                                 |                  |                    |                   |                    |                  |                    |                  |
| Dimethylaniline (N,N-Dimethylaniline)                         | 121-69-7                        | 5                | 25                 | 10                | 50                 | –                | –                  | x                |
| Dimethylbenzene; see Xylene                                   |                                 |                  |                    |                   |                    |                  |                    |                  |
| Dimethyl-1,2-dibromo-2,2-dichloroethyl phosphate              | 300-76-5                        | –                | 3                  | –                 | –                  | –                | –                  | x                |
| Dimethylformamide   | 68-12-2                         | 10               | 30                 | –                 | –                  | –                | –                  | x                |
| 2,6-Dimethyl-4-heptanone; see Diisobutyl ketone               |                                 |                  |                    |                   |                    |                  |                    |                  |
| 1,1-Dimethylhydrazine   | 57-14-7                         | 0.5              | 1                  | –                 | –                  | –                | –                  | x                |
| Dimethylphthalate   | 131-11-3                        | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Dimethyl sulfate  | 77-78-1                         | 0.1              | 0.5                | –                 | –                  | –                | –                  | x                |
| Dinitolmide (3,5-Dinitro-o-toluamide)                         | 148-01-6                        | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Dinitrobenzene (all isomers)<br>(meta-)<br>(ortho)<br>(para-) | 99-65-0<br>528-29-0<br>100-25-4 | –                | 1                  | –                 | –                  | –                | –                  | x                |
| Dinitro-o-cresol  | 534-52-1                        | –                | 0.2                | –                 | –                  | –                | –                  | x                |
| Dinitrotoluene  | 25321-14-6                      | –                | 1.5                | –                 | –                  | –                | –                  | x                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance  | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|--|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|  |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Dioxane (Diethylene dioxide)                                     | 123-91-1             | 25               | 90                 | –                 | –                  | –                | –                  | x                |
| Dioxathion (Delnav)  | 78-34-2              | –                | 0.2                | –                 | –                  | –                | –                  | x                |
| Diphenyl (Biphenyl)  | 92-52-4              | 0.2              | 1                  | –                 | –                  | –                | –                  | –                |
| Diphenylamine  | 122-39-4             | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Diphenylmethane diisocyanate; see Methylene bisphenyl isocyanate |                      |                  |                    |                   |                    |                  |                    |                  |
| Dipropylene glycol methyl ether                                  | 34590-94-8           | 100              | 600                | 150               | 900                | –                | –                  | x                |
| Dipropyl ketone  | 123-19-3             | 50               | 235                | –                 | –                  | –                | –                  | –                |
| Diquat   | 2768-72-9            | –                | 0.5                | –                 | –                  | –                | –                  | –                |
| Di-sec-octyl phthalate [Di(2-ethylhexyl) phthalate]              | 117-81-7             | –                | 5                  | –                 | 10                 | –                | –                  | –                |
| Disulfiram   | 97-77-8              | –                | 2                  | –                 | –                  | –                | –                  | –                |
| Disulfoton   | 298-04-4             | –                | 0.1                | –                 | –                  | –                | –                  | x                |
| 2,6-Di-tert-butyl-p-cresol (Butylated hydroxytoluene)            | 128-37-0             | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Diuron   | 330-54-1             | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Divinyl benzene  | 1321-74-0            | 10               | 50                 | –                 | –                  | –                | –                  | –                |
| Emery,<br>Respirable dust<br>Total dust                          | 1302-74-5            | –<br>–           | 5<br>10            | –<br>–            | –<br>–             | –<br>–           | –<br>–             | –<br>–           |
| Endosulfan   | 115-29-7             | –                | 0.1                | –                 | –                  | –                | –                  | x                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance                                  | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|--|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|  |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Endrin                                     | 72-20-8              | –                | 0.1                | –                 | –                  | –                | –                  | x                |
| Epichlorohydrin                            | 106-89-8             | 2                | 8                  | –                 | –                  | –                | –                  | x                |
| EPN  | 2104-64-5            | –                | 0.5                | –                 | –                  | –                | –                  | x                |
| 1,2-Epoxypropane; see Propylene oxide      |                      |                  |                    |                   |                    |                  |                    |                  |
| 2,3-Epoxy-1-propanol; see Glycidol         |                      |                  |                    |                   |                    |                  |                    |                  |
| Ethanethiol; see Ethyl mercaptan           |                      |                  |                    |                   |                    |                  |                    |                  |
| Ethanolamine                               | 141-43-5             | 3                | 8                  | 6                 | 15                 | –                | –                  | –                |
| Ethion                                     | 563-12-2             | –                | 0.4                | –                 | –                  | –                | –                  | x                |
| 2-Ethoxyethanol (EGEE)                     | 110-80-5             | 200              | 740                | –                 | –                  | –                | –                  | x                |
| 2-Ethoxyethyl acetate (Cellosolve acetate) | 111-15-9             | 100              | 540                | –                 | –                  | –                | –                  | x                |
| Ethyl acetate                              | 141-78-6             | 400              | 1400               | –                 | –                  | –                | –                  | –                |
| Ethyl acrylate                             | 140-88-5             | 5                | 20                 | 25                | 100                | –                | –                  | x                |
| Ethyl alcohol (Ethanol)                    | 64-17-5              | 1000             | 1900               | –                 | –                  | –                | –                  | –                |
| 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                | 125               | 545                | –                | –                  | –                |
| Ethyl bromide                              | 74-96-4              | 200              | 890                | 250               | 1100               | –                | –                  | –                |



TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance  | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|--|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|  |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Ethyl butyl ketone (3-Heptanone)                                     | 106-35-4             | 50               | 230                | –                 | –                  | –                | –                  | –                |
| Ethyl chloride   | 75-00-3              | 1000             | 2600               | –                 | –                  | –                | –                  | –                |
| Ethyl ether  | 60-29-7              | 400              | 1200               | 500               | 1500               | –                | –                  | –                |
| Ethyl formate  | 109-94-4             | 100              | 300                | –                 | –                  | –                | –                  | –                |
| Ethyl mercaptan  | 75-08-1              | 0.5              | 1                  | –                 | –                  | –                | –                  | –                |
| Ethyl silicate   | 78-10-4              | 10               | 85                 | –                 | –                  | –                | –                  | –                |
| Ethylene chlorohydrin  | 107-07-3             | –                | –                  | –                 | –                  | 1                | 3                  | x                |
| Ethylenediamine  | 107-15-3             | 10               | 25                 | –                 | –                  | –                | –                  | –                |
| Ethylene dibromide   | 106-93-4             | See table G-2    |                    |                   |                    |                  |                    |                  |
| Ethylene dichloride  | 107-06-2             | 1                | 4                  | 2                 | 8                  | –                | –                  | –                |
| Ethylene glycol  | 107-21-1             | –                | –                  | –                 | –                  | 50               | 125                | –                |
| Ethylene glycol dinitrate (EGDN)                                     | 628-96-6             | –                | –                  | –                 | 0.1                | –                | –                  | x                |
| Ethylene glycol methyl acetate (EGME); see Methyl cellosolve acetate |                      |                  |                    |                   |                    |                  |                    |                  |
| Ethyleneimine; see GI Part 350. Carcinogens <sup>F</sup>             | 151-56-4             |                  |                    |                   |                    |                  |                    |                  |
| Ethylene oxide; see GI & CS Part 304. Ethylene Oxide <sup>F</sup>    | 75-21-8              | 1                | 1.8                | 5                 | 9.0                | -                | -                  | -                |
| Ethylidene chloride; see 1,1-Dichloroethane                          |                      |                  |                    |                   |                    |                  |                    |                  |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance  | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|--|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|  |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Ethylidene norbornene  | 16219-75-3           | –                | –                  | –                 | –                  | 5                | 25                 | –                |
| N-Ethylmorpholine  | 100-74-3             | 5                | 23                 | –                 | –                  | –                | –                  | x                |
| Fenamiphos   | 22224-92-6           | –                | 0.1                | –                 | –                  | –                | –                  | x                |
| Fensulfothion (Dasanit)  | 115-90-2             | –                | 0.1                | –                 | –                  | –                | –                  | –                |
| Fenthion   | 55-38-9              | –                | 0.2                | –                 | –                  | –                | –                  | x                |
| Ferbam, Dust   | 14484-64-1           | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Ferrovandium dust  | 12604-58-9           | –                | 1                  | –                 | 3                  | –                | –                  | –                |
| Fluorides (as F)   | Varies with compound | –                | 2.5                | –                 | –                  | –                | –                  | –                |
| Fluorine   | 7782-41-4            | 0.1              | 0.2                | –                 | –                  | –                | –                  | –                |
| Fluorotrichloromethane (Trichlorofluoromethane)                  | 75-69-4              | –                | –                  | –                 | –                  | 1000             | 5600               | –                |
| Fonofos  | 944-22-9             | –                | 0.1                | –                 | –                  | –                | –                  | x                |
| Formaldehyde; see GI & CS Part 306.<br>Formaldehyde <sup>F</sup> | 50-00-0              | 0.75             | 0.9                | 2                 | 2.5                |                  |                    |                  |
| Formamide  | 75-12-7              | 20               | 30                 | 30                | 45                 | –                | –                  | –                |
| Formic acid  | 64-18-6              | 5                | 9                  | –                 | –                  | –                | –                  | –                |
| Furfural   | 98-01-1              | 2                | 8                  | –                 | –                  | –                | –                  | x                |
| Furfuryl alcohol   | 98-00-0              | 10               | 40                 | 15                | 60                 | –                | –                  | x                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Gasoline  | 8006-61-9            | 300              | 900                | 500               | 1500               | –                | –                  | –                |
| Germanium tetrahydride                                | 7782-65-2            | 0.2              | 0.6                | –                 | –                  | –                | –                  | –                |
| Glutaraldehyde  | 111-30-8             | –                | –                  | –                 | –                  | 0.2              | 0.8                | –                |
| Glycerin,<br>Respirable mist<br>Total mist            | 56-81-5              | –<br>–           | 5<br>10            | –<br>–            | –<br>–             | –<br>–           | –<br>–             | –<br>–           |
| Glycidol  | 556-52-5             | 25               | 75                 | –                 | –                  | –                | –                  | –                |
| Glycol monoethyl ether; see 2-Ethoxyethanol           |                      |                  |                    |                   |                    |                  |                    |                  |
| Grain dust (Oat, wheat, barley)                       | –                    | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Graphite, natural Respirable dust                     | 7782-42-5            | –                | 2.5                | –                 | –                  | –                | –                  | –                |
| Graphite, synthetic,<br>Respirable dust<br>Total dust | –                    | –<br>–           | 5<br>10            | –<br>–            | –<br>–             | –<br>–           | –<br>–             | –<br>–           |
| Guthion <sup>R</sup> ; see Azinphos methyl            |                      |                  |                    |                   |                    |                  |                    |                  |
| Gypsum,<br>Respirable dust<br>Total dust              | 13397-24-5           | –<br>–           | 5<br>15            | –<br>–            | –<br>–             | –<br>–           | –<br>–             | –<br>–           |
| Hafnium   | 7440-58-6            | –                | 0.5                | –                 | –                  | –                | –                  | –                |
| Heptachlor  | 76-44-8              | –                | 0.5                | –                 | –                  | –                | –                  | x                |
| Heptane (n-Heptane)                                   | 142-82-5             | 400              | 1600               | 500               | 2000               | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance                          | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|------------------------------------|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|                                    |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Hexachlorobutadiene                | 87-68-3              | –                | 0.02               | 0.24              | –                  | –                | –                  | –                |
| Hexachlorocyclopentadiene          | 77-47-4              | 0.01             | 0.1                | –                 | –                  | –                | –                  | –                |
| Hexachloroethane                   | 67-72-1              | 1                | 10                 | –                 | –                  | –                | –                  | x                |
| Hexachloronaphthalene              | 1335-87-1            | –                | 0.2                | –                 | –                  | –                | –                  | x                |
| Hexafluoroacetone                  | 684-16-2             | 0.1              | 0.7                | –                 | –                  | –                | –                  | x                |
| n-Hexane                           | 110-54-3             | 50               | 180                | –                 | –                  | –                | –                  | –                |
| Hexane isomers                     | Varies with compound | 500              | 1800               | 1000              | 3600               | –                | –                  | –                |
| 2-Hexanone (Methyl n-butyl ketone) | 591-78-6             | 5                | 20                 | –                 | –                  | –                | –                  | –                |
| Hexone (Methyl isobutyl ketone)    | 108-10-1             | 50               | 205                | 75                | 300                | –                | –                  | –                |
| sec-Hexyl acetate                  | 108-84-9             | 50               | 300                | –                 | –                  | –                | –                  | –                |
| Hexylene glycol                    | 107-41-5             | –                | –                  | –                 | –                  | 25               | 125                | –                |
| Hydrazine                          | 302-01-2             | 0.1              | 0.1                | –                 | –                  | –                | –                  | x                |
| Hydrogenated terphenyls            | 61788-32-7           | 0.5              | 5                  | –                 | –                  | –                | –                  | –                |
| Hydrogen bromide                   | 10035-10-6           | –                | –                  | –                 | –                  | 3                | 10                 | –                |
| Hydrogen chloride                  | 7647-01-0            | –                | –                  | –                 | –                  | 5                | 7                  | –                |
| Hydrogen cyanide                   | 74-90-8              | –                | –                  | 4.7               | 5                  | –                | –                  | x                |
| Hydrogen fluoride (as F)           | 7664-39-3            | 3                | –                  | 6                 | –                  | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance                               | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Hydrogen peroxide                       | 7722-84-1            | 1                | 1.4                | –                 | –                  | –                | –                  | –                |
| Hydrogen selenide (as Se)               | 7783-07-5            | 0.05             | 0.2                | –                 | –                  | –                | –                  | –                |
| Hydrogen sulfide                        | 7783-06-4            | 10               | 14                 | 15                | 21                 | –                | –                  | –                |
| Hydroquinone                            | 123-31-9             | –                | 2                  | –                 | –                  | –                | –                  | –                |
| 2-Hydroxypropyl acrylate                | 999-61-1             | 0.5              | 3                  | –                 | –                  | –                | –                  | x                |
| Indene                                  | 95-13-6              | 10               | 45                 | –                 | –                  | –                | –                  | –                |
| Indium and compounds (as In)            | 7440-74-6            | –                | 0.1                | –                 | –                  | –                | –                  | –                |
| Iodine                                  | 7553-56-2            | –                | –                  | –                 | –                  | 0.1              | 1                  | –                |
| Iodoform                                | 75-47-8              | 0.6              | 10                 | –                 | –                  | –                | –                  | –                |
| Iron oxide fume                         | 1309-37-1            | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Iron pentacarbonyl (as Fe)              | 13463-40-6           | 0.1              | 0.8                | 0.2               | 1.6                | –                | –                  | –                |
| Iron salts (soluble) (as Fe)            | Varies with compound | –                | 1                  | –                 | –                  | –                | –                  | –                |
| Isoamyl acetate                         | 123-92-2             | 100              | 525                | –                 | –                  | –                | –                  | –                |
| Isoamyl alcohol (primary and secondary) | 123-51-3             | 100              | 360                | 125               | 450                | –                | –                  | –                |
| Isobutyl acetate                        | 110-19-0             | 150              | 700                | –                 | –                  | –                | –                  | –                |
| Isobutyl alcohol                        | 78-83-1              | 50               | 150                | –                 | –                  | –                | –                  | –                |
| Isooctyl alcohol                        | 26952-21-6           | 50               | 270                | –                 | –                  | –                | –                  | x                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance  | CAS No. <sup>A</sup> | TWA              |                                 | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|--|----------------------|------------------|---------------------------------|-------------------|--------------------|------------------|--------------------|------------------|
|  |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup>              | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Isophorone   | 78-59-1              | 4                | 23                              | –                 | –                  | –                | –                  | –                |
| Isophorone diisocyanate (IPDI)   | 4098-71-9            | 0.005            | –                               | 0.02              | –                  | –                | –                  | x                |
| 2-Isopropoxyethanol  | 109-59-1             | 25               | 105                             | –                 | –                  | –                | –                  | –                |
| Isopropyl acetate  | 108-21-4             | 250              | 950                             | 310               | 1185               | –                | –                  | –                |
| Isopropyl alcohol  | 67-63-0              | 400              | 980                             | 500               | 1225               | –                | –                  | –                |
| Isopropylamine   | 75-31-0              | 5                | 12                              | 10                | 24                 | –                | –                  | –                |
| N-Isopropylaniline   | 768-52-5             | 2                | 10                              | –                 | –                  | –                | –                  | x                |
| Isopropyl ether  | 108-20-3             | 500              | 2100                            | –                 | –                  | –                | –                  | –                |
| Isopropyl glycidyl ether (IGE)   | 4016-14-2            | 50               | 240                             | 75                | 360                | –                | –                  | –                |
| Kaolin,<br>Respirable dust   | –                    | –                | 5                               | –                 | –                  | –                | –                  | –                |
| Total dust   | –                    | –                | 10                              | –                 | –                  | –                | –                  | –                |
| Ketene   | 463-51-4             | 0.5              | 0.9                             | 1.5               | 3                  | –                | –                  | –                |
| Lead inorganic (as Pb); see GI Part 310. Lead in General Industry <sup>F</sup> | 7439-92-1            | –                | 0.05<br>(50 µg/m <sup>3</sup> ) | –                 | –                  | –                | –                  | –                |
| Limestone, (calcium carbonate)<br>Respirable dust                              | 1317-65-3            | –                | 5                               | –                 | –                  | –                | –                  | –                |
| Total dust   | –                    | –                | 15                              | –                 | –                  | –                | –                  | –                |
| Lindane  | 58-89-9              | –                | 0.5                             | –                 | –                  | –                | –                  | x                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance                                       | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Lithium hydride                                 | 7580-67-8            | –                | 0.025              | –                 | –                  | –                | –                  | –                |
| L.P.G. (Liquified petroleum gas)                | 68476-85-7           | 1000             | 1800               | –                 | –                  | –                | –                  | –                |
| Magnesite,<br>Respirable dust                   | 546-93-0             | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Total dust                                      |                      | –                | 15                 | –                 | –                  | –                | –                  | –                |
| Magnesium oxide fume, Total particulate         | 1309-48-4            | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Malathion dust                                  | 121-75-5             | –                | 10                 | –                 | –                  | –                | –                  | x                |
| Maleic anhydride                                | 108-31-6             | 1                | –                  | –                 | –                  | –                | –                  | –                |
| Manganese,<br>Compounds (as Mn)                 | 7439-96-5            | –                | –                  | –                 | –                  | –                | 5                  | –                |
| Fume (as Mn)                                    |                      | –                | 1                  | –                 | 3                  | –                | –                  | –                |
| Manganese cyclopentadienyl tricarbonyl (as Mn)  | 12079-65-1           | –                | 0.1                | –                 | –                  | –                | –                  | x                |
| Manganese tetroxide (as Mn)                     | 1317-35-7            | –                | 1                  | –                 | –                  | –                | –                  | –                |
| Marble (calcium carbonate),<br>Respirable dust  | 1317-65-3            | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Total dust                                      |                      | –                | 15                 | –                 | –                  | –                | –                  | –                |
| Mercury<br>Inorganic and aryl compounds (As Hg) | 7439-97-6            | –                | –                  | –                 | –                  | –                | 0.1                | x                |
| Organic compounds (as Hg)                       |                      | –                | 0.01               | –                 | 0.03               | –                | –                  | x                |
| Vapor (as Hg)                                   |                      | –                | 0.05               | –                 | –                  | –                | –                  | x                |
| Mesityl oxide                                   | 141-79-7             | 15               | 60                 | 25                | 100                | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Methacrylic acid                                  | 79-41-4              | 20               | 70                 | –                 | –                  | –                | –                  | x                |
| Methanethiol; see Methyl mercaptan                |                      |                  |                    |                   |                    |                  |                    |                  |
| Methomyl (Lannate)                                | 16752-77-5           | –                | 2.5                | –                 | –                  | –                | –                  | –                |
| Methoxychlor dust                                 | 72-43-5              | –                | 10                 | –                 | –                  | –                | –                  | –                |
| 2-Methoxyethanol; see Methyl cellosolve           |                      |                  |                    |                   |                    |                  |                    |                  |
| 4-Methoxyphenol                                   | 150-76-5             | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Methyl acetate                                    | 79-20-9              | 200              | 610                | 250               | 760                | –                | –                  | –                |
| Methyl acetylene (Propyne)                        | 74-99-7              | 1000             | 1650               | –                 | –                  | –                | –                  | –                |
| Methyl acetylene-propadiene mixture (MAPP)        | –                    | 1000             | 1800               | 1250              | 2250               | –                | –                  | –                |
| Methyl acrylate                                   | 96-33-3              | 10               | 35                 | –                 | –                  | –                | –                  | x                |
| Methylacrylonitrile                               | 126-98-7             | 1                | 3                  | –                 | –                  | –                | –                  | x                |
| Methylal (Dimethoxymethane)                       | 109-87-5             | 1000             | 3100               | –                 | –                  | –                | –                  | –                |
| Methyl alcohol                                    | 67-56-1              | 200              | 260                | 250               | 325                | –                | –                  | x                |
| Methylamine                                       | 74-89-5              | 10               | 12                 | –                 | –                  | –                | –                  | –                |
| Methyl amyl alcohol; see Methyl isobutyl carbinol |                      |                  |                    |                   |                    |                  |                    |                  |
| Methyl n-amyl ketone                              | 110-43-0             | 100              | 465                | –                 | –                  | –                | –                  | –                |
| Methyl bromide                                    | 74-83-9              | 5                | 20                 | –                 | –                  | –                | –                  | x                |



TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance  | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|--|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|  |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Methyl n-butyl ketone; see 2-Hexanone                                |                      |                  |                    |                   |                    |                  |                    |                  |
| Methyl cellosolve (2-Methoxyethanol)                                 | 109-86-4             | 25               | 80                 | –                 | –                  | –                | –                  | x                |
| Methyl cellosolve acetate (2-Methoxyethyl acetate)                   | 110-49-6             | 25               | 120                | –                 | –                  | –                | –                  | x                |
| Methyl chloride  | 74-87-3              | 50               | 105                | 100               | 210                | –                | –                  | –                |
| Methyl chloroform (1,1,1-Trichloroethane)                            | 71-55-6              | 350              | 1900               | 450               | 2450               | –                | –                  | –                |
| Methyl 2-cyanoacrylate   | 137-05-3             | 2                | 8                  | 4                 | 16                 | –                | –                  | –                |
| Methylcyclohexane  | 108-87-2             | 400              | 1600               | –                 | –                  | –                | –                  | –                |
| Methylcyclohexanol   | 25639-42-3           | 50               | 235                | –                 | –                  | –                | –                  | –                |
| o-Methylcyclohexanone  | 583-60-8             | 50               | 230                | 75                | 345                | –                | –                  | x                |
| Methylcyclopentadienyl manganese tricarbonyl (as Mn)                 | 12108-13-3           | –                | 0.2                | –                 | –                  | –                | –                  | x                |
| Methyl demeton   | 8022-00-2            | –                | 0.5                | –                 | –                  | –                | –                  | x                |
| 4,4'-Methylene bis(2-chloroaniline) (MBOCA)                          | 101-14-4             | 0.02             | 0.22               | –                 | –                  | –                | –                  | x                |
| Methylene bis(4-cyclohexylisocyanate) (MCBI)                         | 5124-30-1            | –                | –                  | –                 | –                  | 0.01             | 0.11               | –                |
| Methylene bisphenyl isocyanate (MDI)                                 | 101-68-8             | –                | –                  | –                 | –                  | 0.02             | 0.2                | –                |
| Methylene chloride, see OH Part 313. Methylene Chloride <sup>F</sup> | 75-09-2              | 25               | 87                 | 125               | 434                |                  |                    |                  |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup> | TWA              |                        | STEL <sup>D</sup> |                       | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|------------------------|-------------------|-----------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup>     | ppm <sup>B</sup>  | mg/m <sup>3C</sup>    | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Methylenedianiline (MDA); see GI Part 303.<br>Methylenedianiline (MDA) in General Industry <sup>F</sup> | 101-77-9             | 10<br>ppb**      | 0.08 mg/m <sup>3</sup> | 100<br>ppb**      | 0.8 mg/m <sup>3</sup> | –                | –                  | –                |
| Methyl ethyl ketone (MEK); see 2-Butanone   |                      |                  |                        |                   |                       |                  |                    |                  |
| Methyl ethyl ketone peroxide (MEKP)   | 1338-23-4            | –                | –                      | –                 | –                     | 0.7              | 5                  | –                |
| Methyl formate  | 107-31-3             | 100              | 250                    | 150               | 375                   | –                | –                  | –                |
| Methyl hydrazine  | 60-34-4              | –                | –                      | –                 | –                     | 0.2              | 0.35               | x                |
| Methyl iodide   | 74-88-4              | 2                | 10                     | –                 | –                     | –                | –                  | x                |
| Methyl isoamyl ketone   | 110-12-3             | 50               | 240                    | –                 | –                     | –                | –                  | –                |
| Methyl isobutyl carbinol  | 108-11-2             | 25               | 100                    | 40                | 165                   | –                | –                  | x                |
| Methyl isobutyl ketone; see Hexone  |                      |                  |                        |                   |                       |                  |                    |                  |
| Methyl isocyanate (MIC)   | 624-83-9             | 0.02             | 0.05                   | –                 | –                     | –                | –                  | x                |
| Methyl isopropyl ketone   | 563-80-4             | 200              | 705                    | –                 | –                     | –                | –                  | –                |
| Methyl mercaptan  | 74-93-1              | 0.5              | 1                      | –                 | –                     | –                | –                  | –                |
| 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             | 1                | 6                      | –                 | –                     | 5                | 30                 | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| alpha-Methyl styrene  | 98-83-9              | 50               | 240                | 100               | 485                | –                | –                  | –                |
| Metribuzin  | 21087-64-9           | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Mica; see Silicates   |                      |                  |                    |                   |                    |                  |                    |                  |
| Molybdenum, (as Mo)   |                      |                  |                    |                   |                    |                  |                    |                  |
| Insoluble compounds   | 7439-98-7            | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Soluble compounds   |                      | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Monocrotophos (Azodrin <sup>R</sup> )                             | 6923-22-4            | –                | 0.25               | –                 | –                  | –                | –                  | –                |
| Monomethyl aniline  | 100-61-8             | 0.5              | 2                  | –                 | –                  | –                | –                  | x                |
| Morpholine  | 110-91-8             | 20               | 70                 | 30                | 105                | –                | –                  | x                |
| Naphtha (Coal tar)  | 8030-30-6            | 100              | 400                | –                 | –                  | –                | –                  | –                |
| Naphthalene   | 91-20-3              | 10               | 50                 | 15                | 75                 | –                | –                  | –                |
| alpha-Naphthylamine; see GI Part 350.<br>Carcinogens <sup>F</sup> | 134-32-7             |                  |                    |                   |                    |                  |                    |                  |
| beta-Naphthylamine; see GI Part 350.<br>Carcinogens <sup>F</sup>  | 91-59-8              |                  |                    |                   |                    |                  |                    |                  |
| Nickel carbonyl (as Ni)   | 13463-39-3           | 0.001            | 0.007              | –                 | –                  | –                | –                  | –                |
| Nickel,<br>Metal and insoluble compounds (as Ni)                  | 7440-02-0            | –                | 1                  | –                 | –                  | –                | –                  | –                |
| Soluble compounds (as Ni)   |                      | –                | 0.1                | –                 | –                  | –                | –                  | –                |
| Nicotine  | 54-11-5              | –                | 0.5                | –                 | –                  | –                | –                  | x                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Nitric acid   | 7697-37-2            | 2                | 5                  | 4                 | 10                 | –                | –                  | –                |
| Nitric oxide  | 10102-43-9           | 25               | 30                 | –                 | –                  | –                | –                  | –                |
| p-Nitroaniline  | 100-01-6             | –                | 3                  | –                 | –                  | –                | –                  | x                |
| Nitrobenzene  | 98-95-3              | 1                | 5                  | –                 | –                  | –                | –                  | x                |
| p-Nitrochlorobenzene  | 100-00-5             | –                | 1                  | –                 | –                  | –                | –                  | x                |
| 4-Nitrodiphenyl; see GI Part 350. Carcinogens <sup>F</sup>        | 92-93-3              |                  |                    |                   |                    |                  |                    |                  |
| Nitroethane   | 79-24-3              | 100              | 310                | –                 | –                  | –                | –                  | –                |
| Nitrogen dioxide  | 10102-44-0           | –                | –                  | 1                 | 1.8                | –                | –                  | –                |
| Nitrogen trifluoride  | 7783-54-2            | 10               | 29                 | –                 | –                  | –                | –                  | –                |
| Nitroglycerin   | 55-63-0              | –                | –                  | –                 | 0.1                | –                | –                  | x                |
| Nitromethane  | 75-52-5              | 100              | 250                | –                 | –                  | –                | –                  | –                |
| 1-Nitropropane  | 108-03-2             | 25               | 90                 | –                 | –                  | –                | –                  | –                |
| 2-Nitropropane  | 79-46-9              | 10               | 35                 | –                 | –                  | –                | –                  | –                |
| N-Nitrosodimethylamine; see GI Part 350. Carcinogens <sup>F</sup> | 62-75-9              |                  |                    |                   |                    |                  |                    |                  |
| Nitrotoluene (o-,m-,p-isomers)                                    | 99-08-1              | 2                | 11                 | –                 | –                  | –                | –                  | x                |
| Nitrotrichloromethane; see Chloropicrin                           |                      |                  |                    |                   |                    |                  |                    |                  |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance  | CAS No. <sup>A</sup>                | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|--|-------------------------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|  |                                     | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Nonane   | 111-84-2                            | 200              | 1050               | –                 | –                  | –                | –                  | –                |
| Octachloronaphthalene                                    | 2234-13-1                           | –                | 0.1                | –                 | 0.3                | –                | –                  | x                |
| Octane   | 111-65-9                            | 300              | 1450               | 375               | 1800               | –                | –                  | –                |
| Oil mist, mineral  | 8012-95-1                           | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Osmium tetroxide (as Os)                                 | 20816-12-0                          | –                | 0.002              | –                 | 0.006              | –                | –                  | –                |
| Oxalic acid  | 144-62-7                            | –                | 1                  | –                 | 2                  | –                | –                  | –                |
| Oxygen difluoride  | 7783-41-7                           | –                | –                  | –                 | –                  | 0.05             | 0.1                | –                |
| Ozone  | 10028-15-6                          | 0.1              | 0.2                | 0.3               | 0.6                | –                | –                  | –                |
| Paraffin wax fume  | 8002-74-2                           | –                | 2                  | –                 | –                  | –                | –                  | –                |
| Paraquat, respirable dust                                | 1910-42-5<br>2074-50-2<br>4685-14-7 | –                | 0.1                | –                 | –                  | –                | –                  | x                |
| Parathion  | 56-38-2                             | –                | 0.1                | –                 | –                  | –                | –                  | x                |
| Particulates not otherwise regulated,<br>Respirable dust | –                                   | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Total dust   | –                                   | –                | 15                 | –                 | –                  | –                | –                  | –                |
| Pentaborane  | 19624-22-7                          | 0.005            | 0.01               | 0.015             | 0.03               | –                | –                  | –                |
| Pentachloronaphthalene                                   | 1321-64-8                           | –                | 0.5                | –                 | –                  | –                | –                  | x                |
| Pentachlorophenol  | 87-86-5                             | –                | 0.5                | –                 | –                  | –                | –                  | x                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Pentaerythritol,<br>Respirable dust<br>Total dust | 115-77-5             | –<br>–           | 5<br>10            | –<br>–            | –<br>–             | –<br>–           | –<br>–             | –<br>–           |
| Pentane   | 109-66-0             | 600              | 1800               | 750               | 2250               | –                | –                  | –                |
| 2-Pentanone (Methyl propyl ketone)                | 107-87-9             | 200              | 700                | 250               | 875                | –                | –                  | –                |
| Perchloroethylene (Tetrachloroethylene)           | 127-18-4             | 25               | 170                | –                 | –                  | –                | –                  | –                |
| Perchloromethyl mercaptan                         | 594-42-3             | 0.1              | 0.8                | –                 | –                  | –                | –                  | –                |
| Perchloryl fluoride                               | 7616-94-6            | 3                | 14                 | 6                 | 28                 | –                | –                  | –                |
| Perlite<br>Respirable dust<br>Total dust          | 93763-70-3           | –<br>–           | 5<br>15            | –<br>–            | –<br>–             | –<br>–           | –<br>–             | –<br>–           |
| Petroleum distillates (Naphtha) (Rubber solvent)  |                      | 400              | 1600               | –                 | –                  | –                | –                  | –                |
| Phenol  | 108-95-2             | 5                | 19                 | –                 | –                  | –                | –                  | x                |
| Phenothiazine                                     | 92-84-2              | –                | 5                  | –                 | –                  | –                | –                  | x                |
| p-Phenylenediamine                                | 106-50-3             | –                | 0.1                | –                 | –                  | –                | –                  | x                |
| Phenyl ether, vapor                               | 101-84-8             | 1                | 7                  | –                 | –                  | –                | –                  | –                |
| Phenyl ether-biphenyl mixture, vapor              | –                    | 1                | 7                  | –                 | –                  | –                | –                  | –                |
| Phenylethylene; see Styrene                       |                      |                  |                    |                   |                    |                  |                    |                  |
| Phenyl glycidyl ether (PGE)                       | 122-60-1             | 1                | 6                  | –                 | –                  | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance                          | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|------------------------------------|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|                                    |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Phenylhydrazine                    | 100-63-0             | 5                | 20                 | 10                | 45                 | –                | –                  | x                |
| Phenyl mercaptan                   | 108-98-5             | 0.5              | 2                  | –                 | –                  | –                | –                  | –                |
| Phenylphosphine                    | 638-21-1             | –                | –                  | –                 | –                  | 0.05             | 0.25               | –                |
| Phorate                            | 298-02-2             | –                | 0.05               | –                 | 0.2                | –                | –                  | x                |
| Phosdrin (Mevinphos <sup>R</sup> ) | 7786-34-7            | –                | 0.1                | –                 | 0.3                | –                | –                  | x                |
| Phosgene (Carbonyl chloride)       | 75-44-5              | 0.1              | 0.4                | –                 | –                  | –                | –                  | –                |
| Phosphine                          | 7803-51-2            | 0.3              | 0.4                | 1                 | 1                  | –                | –                  | –                |
| Phosphoric acid                    | 7664-38-2            | –                | 1                  | –                 | 3                  | –                | –                  | –                |
| Phosphorus (yellow)                | 7723-14-0            | –                | 0.1                | –                 | –                  | –                | –                  | –                |
| Phosphorus oxychloride             | 10025-87-3           | 0.1              | 0.6                | –                 | –                  | –                | –                  | –                |
| Phosphorus pentachloride           | 10026-13-8           | –                | 1                  | –                 | –                  | –                | –                  | –                |
| Phosphorus pentasulfide            | 1314-80-3            | –                | 1                  | –                 | 3                  | –                | –                  | –                |
| Phosphorus trichloride             | 7719-12-2            | 0.2              | 1.5                | 0.5               | 3                  | –                | –                  | –                |
| Phthalic anhydride                 | 85-44-9              | 1                | 6                  | –                 | –                  | –                | –                  | –                |
| m-Phthalodinitrile                 | 626-17-5             | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Picloram,<br>Respirable dust       | 1918-02-1            | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Total dust                         |                      | –                | 10                 | –                 | –                  | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Picric acid   | 88-89-1              | –                | 0.1                | –                 | –                  | –                | –                  | x                |
| Piperazine dihydrochloride                                    | 142-64-3             | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Pindone (2-Pivalyl-1,3-indandione)                            | 83-26-1              | –                | 0.1                | –                 | –                  | –                | –                  | –                |
| Plaster of Paris (Calcium sulfate),<br>Respirable dust        | 26499-65-0           | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Total dust  |                      | –                | 15                 | –                 | –                  | –                | –                  | –                |
| Platinum (as Pt)<br>Metal                                     | 7440-06-4            | –                | 1                  | –                 | –                  | –                | –                  | –                |
| Soluble salts   |                      | –                | 0.002              | –                 | –                  | –                | –                  | –                |
| Portland cement,<br>Respirable dust                           | 65997-15-1           | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Total dust  |                      | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Potassium hydroxide   | 1310-58-3            | –                | –                  | –                 | –                  | –                | 2                  | –                |
| Propane   | 74-98-6              | 1000             | 1800               | –                 | –                  | –                | –                  | –                |
| Propargyl alcohol   | 107-19-7             | 1                | 2                  | –                 | –                  | –                | –                  | x                |
| beta-Propiolactone; see GI Part 350. Carcinogens <sup>F</sup> | 57-57-8              |                  |                    |                   |                    |                  |                    |                  |
| Propionic acid  | 79-09-4              | 10               | 30                 | –                 | –                  | –                | –                  | –                |
| Propoxur (Baygon)   | 114-26-1             | –                | 0.5                | –                 | –                  | –                | –                  | –                |
| n-Propyl acetate  | 109-60-4             | 200              | 840                | 250               | 1050               | –                | –                  | –                |
| n-Propyl alcohol  | 71-23-8              | 200              | 500                | 250               | 625                | –                | –                  | –                |



TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| n-Propyl nitrate                                      | 627-13-4             | 25               | 105                | 40                | 170                | –                | –                  | –                |
| Propylene dichloride                                  | 78-87-5              | 75               | 350                | 110               | 510                | –                | –                  | –                |
| Propylene glycol dinitrate                            | 6423-43-4            | 0.05             | 0.3                | –                 | –                  | –                | –                  | –                |
| Propylene glycol monomethyl ether                     | 107-98-2             | 100              | 360                | 150               | 540                | –                | –                  | –                |
| Propylene imine                                       | 75-55-8              | 2                | 5                  | –                 | –                  | –                | –                  | x                |
| Propylene oxide                                       | 75-56-9              | 20               | 50                 | –                 | –                  | –                | –                  | –                |
| Propyne; see Methyl acetylene                         |                      |                  |                    |                   |                    |                  |                    |                  |
| Pyrethrum   | 8003-34-7            | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Pyridine  | 110-86-1             | 5                | 15                 | –                 | –                  | –                | –                  | –                |
| Quinone   | 106-51-4             | 0.1              | 0.4                | –                 | –                  | –                | –                  | –                |
| Resorcinol  | 108-46-3             | 10               | 45                 | 20                | 90                 | –                | –                  | –                |
| Rhodium,<br>Insoluble compounds (as Rh)               | 7440-16-6            | –                | 0.1                | –                 | –                  | –                | –                  | –                |
| Metal fume (as Rh)                                    |                      | –                | 0.1                | –                 | –                  | –                | –                  | –                |
| Soluble compounds (as Rh)                             |                      | –                | 0.001              | –                 | –                  | –                | –                  | –                |
| Ronnel  | 299-84-3             | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Rosin core solder pyrolysis products, as formaldehyde | –                    | –                | 0.1                | –                 | –                  | –                | –                  | –                |
| Rotenone  | 83-79-4              | –                | 5                  | –                 | –                  | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup>                        | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|---|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |   | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Rouge,<br>Respirable dust   | –   | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Total dust  | –   | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Selenium compounds (as Se)  | 7782-49-2                                   | –                | 0.2                | –                 | –                  | –                | –                  | –                |
| Selenium hexafluoride (as Se)   | 7783-79-1                                   | 0.05             | 0.4                | –                 | –                  | –                | –                  | –                |
| Silica, amorphous, precipitated and gel   | 112926-00-8                                 | –                | 6                  | –                 | –                  | –                | –                  | –                |
| Silica, amorphous, diatomaceous earth, containing less than 1% crystalline silica | 61790-53-2                                  | –                | 6                  | –                 | –                  | –                | –                  | –                |
| Silica, crystalline, respirable dust  | See GI Part 590. Silica in General Industry |                  |                    |                   |                    |                  |                    |                  |
| Cristobalite  | 14464-46-1                                  | –                | 0.05               | –                 | –                  | –                | –                  | –                |
| Quartz  | 14808-60-7                                  | –                | 0.05               | –                 | –                  | –                | –                  | –                |
| Tridymite   | 15468-32-3                                  | –                | 0.05               | –                 | –                  | –                | –                  | –                |
| Tripoli (as quartz)   | 1317-95-9                                   | –                | 0.05               | –                 | –                  | –                | –                  | –                |
| Silica, fused, Respirable dust  | 60676-86-0                                  | –                | 0.1                | –                 | –                  | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance                                      | CAS No. <sup>A</sup> | TWA  |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|--|----------------------|--|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|  |                      | ppm <sup>B</sup>                             | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Silicates (less than 1% crystalline silica)    |                      |  |                    |                   |                    |                  |                    |                  |
| Mica, respirable dust                          | 12001-26-2           | –  | 3                  | –                 | –                  | –                | –                  | –                |
| Soapstone, respirable dust                     | –                    | –  | 3                  | –                 | –                  | –                | –                  | –                |
| Soapstone, total dust                          | –                    | –  | 6                  | –                 | –                  | –                | –                  | –                |
| Talc (containing asbestos); use asbestos limit | –                    | OH Part 305 “Asbestos for General Industry,” |                    |                   |                    |                  |                    |                  |
| Talc (containing no asbestos), respirable dust | 14807-96-6           | –  | 2                  | –                 | –                  | –                | –                  | –                |
| Tremolite                                      | –                    | OH Part 305 “Asbestos for General Industry,” |                    |                   |                    |                  |                    |                  |
| Silicon,<br>Respirable dust                    | 7440-21-3            | –  | 5                  | –                 | –                  | –                | –                  | –                |
| Total dust                                     |                      | –  | 10                 | –                 | –                  | –                | –                  | –                |
| Silicon carbide,<br>Respirable dust            | 409-21-2             | –  | 5                  | –                 | –                  | –                | –                  | –                |
| Total dust                                     |                      | –  | 10                 | –                 | –                  | –                | –                  | –                |
| Silicon tetrahydride                           | 7803-62-5            | 5  | 7                  | –                 | –                  | –                | –                  | –                |
| Silver, metal and soluble compounds (as Ag)    | 7440-22-4            | –  | 0.01               | –                 | –                  | –                | –                  | –                |
| Soapstone; see Silicates                       |                      |  |                    |                   |                    |                  |                    |                  |
| Sodium azide<br>(as HN <sub>3</sub> )          | 26628-22-8           | –  | –                  | –                 | –                  | 0.1              | –                  | x                |
| (as NaN <sub>3</sub> )                         |                      | –  | –                  | –                 | –                  | –                | 0.3                | x                |
| Sodium bisulfite                               | 7631-90-5            | –  | 5                  | –                 | –                  | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance                                 | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                      | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|----------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup>   | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Sodium fluoroacetate                      | 62-74-8              | –                | 0.05               | –                 | 0.15                 | –                | –                  | x                |
| Sodium hydroxide                          | 1310-73-2            | –                | –                  | –                 | –                    | –                | 2                  | –                |
| Sodium metabisulfite                      | 7681-57-4            | –                | 5                  | –                 | –                    | –                | –                  | –                |
| Starch,<br>Respirable dust<br>Total dust  | 9005-25-8            | –<br>–           | 5<br>15            | –<br>–            | –<br>–               | –<br>–           | –<br>–             | –<br>–           |
| Stibine                                   | 7803-52-3            | 0.1              | 0.5                | –                 | –                    | –                | –                  | –                |
| Stoddard solvent                          | 8052-41-3            | 100              | 525                | –                 | –                    | –                | –                  | –                |
| Strychnine                                | 57-24-9              | –                | 0.15               | –                 | –                    | –                | –                  | –                |
| Styrene                                   | 100-42-5             | 50               | 215                | 100               | 425                  | –                | –                  | –                |
| Subtilisins (Proteolytic enzymes)         | 9014-01-1            | –                | –                  | –                 | 0.00006<br>(60 min.) | –                | –                  | –                |
| Sucrose,<br>Respirable dust<br>Total dust | 57-50-1              | –<br>–           | 5<br>15            | –<br>–            | –<br>–               | –<br>–           | –<br>–             | –<br>–           |
| Sulfur dioxide                            | 7446-09-5            | 2                | 5                  | 5                 | 10                   | –                | –                  | –                |
| Sulfur hexafluoride                       | 2551-62-4            | 1000             | 6000               | –                 | –                    | –                | –                  | –                |
| Sulfuric acid                             | 7664-93-9            | –                | 1                  | –                 | –                    | –                | –                  | –                |
| Sulfur monochloride                       | 10025-67-9           | –                | –                  | –                 | –                    | 1                | 6                  | –                |
| Sulfur pentafluoride                      | 5714-22-7            | –                | –                  | –                 | –                    | 0.01             | 0.1                | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance                                   | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Sulfur tetrafluoride                        | 7783-60-0            | –                | –                  | –                 | –                  | 0.1              | 0.4                | –                |
| Sulfuryl fluoride                           | 2699-79-8            | 5                | 20                 | 10                | 40                 | –                | –                  | –                |
| Sulprofos                                   | 35400-43-2           | –                | 1                  | –                 | –                  | –                | –                  | –                |
| Systox <sup>R</sup> ; see Demeton           |                      |                  |                    |                   |                    |                  |                    |                  |
| 2,4,5-T (2,4,5-trichlorophenoxyacetic acid) | 93-76-5              | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Talc; see Silicates                         |                      |                  |                    |                   |                    |                  |                    |                  |
| Tantalum, metal and oxide dust              | 7440-25-7            | –                | 5                  | –                 | –                  | –                | –                  | –                |
| TEDP (Sulfotep)                             | 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,<br>Respirable dust<br>Total dust  | 3383-96-8            | –<br>–           | 5<br>10            | –<br>–            | –<br>–             | –<br>–           | –<br>–             | –<br>–           |
| TEPP  | 107-49-3             | –                | 0.05               | –                 | –                  | –                | –                  | x                |
| Terphenyls                                  | 26140-60-3           | –                | –                  | –                 | –                  | 0.5              | 5                  | –                |
| 1,1,1,2-Tetrachloro-2, 2-difluoroethane     | 76-11-9              | 500              | 4170               | –                 | –                  | –                | –                  | –                |
| 1,1,2,2-Tetrachloro-1, 2-difluoroethane     | 76-12-0              | 500              | 4170               | –                 | –                  | –                | –                  | –                |
| 1,1,2,2-Tetrachloroethane                   | 79-34-5              | 1                | 7                  | –                 | –                  | –                | –                  | x                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance                                     | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Tetrachloroethylene; see Perchloroethylene    |                      |                  |                    |                   |                    |                  |                    |                  |
| Tetrachloromethane; see Carbon tetrachloride  |                      |                  |                    |                   |                    |                  |                    |                  |
| Tetrachloronaphthalene                        | 1335-88-2            | –                | 2                  | –                 | –                  | –                | –                  | x                |
| Tetraethyl lead (as Pb)                       | 78-00-2              | –                | 0.075              | –                 | –                  | –                | –                  | x                |
| Tetrahydrofuran                               | 109-99-9             | 200              | 590                | 250               | 735                | –                | –                  | –                |
| Tetramethyl lead (as Pb)                      | 75-74-1              | –                | 0.075              | –                 | –                  | –                | –                  | x                |
| Tetramethyl succinonitrile                    | 3333-52-6            | 0.5              | 3                  | –                 | –                  | –                | –                  | x                |
| Tetranitromethane                             | 509-14-8             | 1                | 8                  | –                 | –                  | –                | –                  | –                |
| Tetrasodium pyrophosphate                     | 7722-88-5            | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Tetryl (2,4,6-Trinitrophenylmethyl nitramine) | 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)           |                      |                  |                    |                   |                    |                  |                    |                  |
| Respirable dust                               | 96-69-5              | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Total dust                                    |                      | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Thioglycolic acid                             | 68-11-1              | 1                | 4                  | –                 | –                  | –                | –                  | x                |
| Thionyl chloride                              | 7719-09-7            | –                | –                  | –                 | –                  | 1                | 5                  | –                |
| Thiram  | 137-26-8             | –                | 5                  | –                 | –                  | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Tin, Inorganic compounds (except oxides)<br>(as Sn) | 7440-31-5            | –                | 2                  | –                 | –                  | –                | –                  | –                |
| Organic compounds (as Sn)                           | 7440-31-5            | –                | 0.1                | –                 | –                  | –                | –                  | x                |
| Oxides (as Sn)                                      | 21651-19-4           | –                | 2                  | –                 | –                  | –                | –                  | –                |
| Titanium dioxide Total dust                         | 13463-67-7           | –                | 10                 | –                 | –                  | –                | –                  | –                |
| Toluene   | 108-88-3             | 100              | 375                | 150               | 560                | –                | –                  | –                |
| Toluene-2,4-diisocyanate (TDI)                      | 584-84-9             | 0.005            | 0.04               | 0.02              | 0.15               | –                | –                  | –                |
| m-Toluidine   | 108-44-1             | 2                | 9                  | –                 | –                  | –                | –                  | x                |
| o-Toluidine   | 95-53-4              | 5                | 22                 | –                 | –                  | –                | –                  | x                |
| p-Toluidine   | 106-49-0             | 2                | 9                  | –                 | –                  | –                | –                  | x                |
| Toxaphene; see Chlorinated camphene                 |                      |                  |                    |                   |                    |                  |                    |                  |
| Tremolite; see Silicates                            |                      |                  |                    |                   |                    |                  |                    |                  |
| Tributyl phosphate                                  | 126-73-8             | 0.2              | 2.5                | –                 | –                  | –                | –                  | –                |
| Trichloroacetic acid                                | 76-03-9              | 1                | 7                  | –                 | –                  | –                | –                  | –                |
| 1,2,4-Trichlorobenzene                              | 120-82-1             | –                | –                  | –                 | –                  | 5                | 40                 | –                |
| 1,1,1-Trichloroethane; see Methyl chloroform        |                      |                  |                    |                   |                    |                  |                    |                  |
| 1,1,2-Trichloroethane                               | 79-00-5              | 10               | 45                 | –                 | –                  | –                | –                  | x                |
| Trichloroethylene                                   | 79-01-6              | 50               | 270                | 200               | 1080               | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance                                       | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Trichloromethane; see Chloroform                |                      |                  |                    |                   |                    |                  |                    |                  |
| Trichloronaphthalene                            | 1321-65-9            | –                | 5                  | –                 | –                  | –                | –                  | x                |
| 1,2,3-Trichloropropane                          | 96-18-4              | 10               | 60                 | –                 | –                  | –                | –                  | –                |
| 1,1,2-Trichloro-1,2,2-trifluoroethane           | 76-13-1              | 1000             | 7600               | 1250              | 9500               | –                | –                  | –                |
| Triethylamine                                   | 121-44-8             | 10               | 40                 | 15                | 60                 | –                | –                  | –                |
| Trifluorobromomethane                           | 75-63-8              | 1000             | 6100               | –                 | –                  | –                | –                  | –                |
| Trimellitic anhydride                           | 552-30-7             | 0.005            | 0.04               | –                 | –                  | –                | –                  | –                |
| Trimethylamine                                  | 75-50-3              | 10               | 24                 | 15                | 36                 | –                | –                  | –                |
| Trimethyl benzene                               | 25551-13-7           | 25               | 125                | –                 | –                  | –                | –                  | –                |
| Trimethyl phosphite                             | 121-45-9             | 2                | 10                 | –                 | –                  | –                | –                  | –                |
| 2,4,6-Trinitrophenol; see Picric acid           |                      |                  |                    |                   |                    |                  |                    |                  |
| 2,4,6-Trinitrophenylmethylnitramine; see Tetryl |                      |                  |                    |                   |                    |                  |                    |                  |
| 2,4,6-Trinitrotoluene (TNT)                     | 118-96-7             | –                | 0.5                | –                 | –                  | –                | –                  | x                |
| Triorthocresyl phosphate                        | 78-30-8              | –                | 0.1                | –                 | –                  | –                | –                  | x                |
| Triphenyl amine                                 | 603-34-9             | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Triphenyl phosphate                             | 115-86-6             | –                | 3                  | –                 | –                  | –                | –                  | –                |



TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance  | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|--|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|  |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Tungsten   |                      |                  |                    |                   |                    |                  |                    |                  |
| Insoluble compounds (as W)                                   | 7440-33-7            | –                | 5                  | –                 | 10                 | –                |                    | –                |
| Soluble compounds (as W)                                     |                      | –                | 1                  | –                 | 3                  | –                | –                  |                  |
| Turpentine   | 8006-64-2            | 100              | 560                | –                 | –                  | –                | –                  | –                |
| Uranium (as U)   |                      |                  |                    |                   |                    |                  |                    |                  |
| Insoluble compounds  | 7440-61-1            | –                | 0.2                | –                 | 0.6                | –                | –                  | –                |
| Soluble compounds  |                      | –                | 0.05               | –                 | –                  | –                | –                  | –                |
| n-Valeraldehyde  | 110-62-3             | 50               | 175                | –                 | –                  | –                | –                  | –                |
| Vanadium pentoxide   |                      |                  |                    |                   |                    |                  |                    |                  |
| Fume (as V <sub>2</sub> O <sub>5</sub> )                     | 1314-62-1            | –                | 0.05               | –                 | –                  | –                | –                  | –                |
| Respirable dust (as V <sub>2</sub> O <sub>5</sub> )          |                      | –                | 0.05               | –                 | –                  | –                | –                  | –                |
| Vegetable oil mists  |                      |                  |                    |                   |                    |                  |                    |                  |
| Respirable mist  | –                    | –                | 5                  | –                 | –                  | –                | –                  | –                |
| Total mist   |                      | –                | 15                 | –                 | –                  | –                | –                  | –                |
| Vinyl acetate  | 108-05-4             | 10               | 30                 | 20                | 60                 | –                | –                  | –                |
| Vinyl benzene; see Styrene                                   |                      |                  |                    |                   |                    |                  |                    |                  |
| Vinyl bromide  | 593-60-2             | 5                | 20                 | –                 | –                  | –                | –                  | –                |
| Vinyl chloride; see GI Part 302. Vinyl Chloride <sup>F</sup> | 75-01-4              | 1                | 2.5                | 5                 | 12.8               |                  |                    |                  |
| Vinyl cyanide; see Acrylonitrile                             |                      |                  |                    |                   |                    |                  |                    |                  |
| Vinyl cyclohexene dioxide                                    | 106-87-6             | 10               | 60                 | –                 | –                  | –                | –                  | x                |
| Vinylidene chloride (1,1-Dichloroethylene)                   | 75-35-4              | 1                | 4                  | –                 | –                  | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance   | CAS No. <sup>A</sup> | TWA              |                              | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|---|----------------------|------------------|------------------------------|-------------------|--------------------|------------------|--------------------|------------------|
|   |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup>           | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Vinyl toluene   | 25013-15-4           | 100              | 480                          | –                 | –                  | –                | –                  | –                |
| VM & P Naphtha  | 8032-32-4            | 300              | 1350                         | 400               | 1800               | –                | –                  | –                |
| Warfarin  | 81-81-2              | –                | 0.1                          | –                 | –                  | –                | –                  | –                |
| Welding fumes (Total particulate)*  | –                    | –                | 5                            | –                 | –                  | –                | –                  | –                |
| Wood dust, all soft and hard woods (except Western red cedar)                               | –                    | –                | 5                            | –                 | 10                 | –                | –                  | –                |
| Wood dust, Western red cedar  | –                    | –                | 2.5                          | –                 | –                  | –                | –                  | –                |
| Xylene (o-,m-,p-isomers) (Dimethyl benzene)   | 1330-20-7            | 100              | 435                          | 150               | 655                | –                | –                  | –                |
| m-Xylene-alpha, alpha'-diamine  | 1477-55-0            | –                | –                            | –                 | –                  | –                | 0.1                | x                |
| Xylidine  | 1300-73-8            | 2                | 10                           | –                 | –                  | –                | –                  | x                |
| Yttrium   | 7440-65-5            | –                | 1                            | –                 | –                  | –                | –                  | –                |
| Zinc chloride fume  | 7646-85-7            | –                | 1                            | –                 | 2                  | –                | –                  | –                |
| Zinc chromates (as Cr+6); see OH Part 315. Chromium (VI) in General Industry <sup>F,G</sup> | Varies with compound | –                | 0.005 (5 µg/m <sup>3</sup> ) | –                 | –                  | –                | –                  | –                |
| Zinc oxide fume   | 1314-13-2            | –                | 5                            | –                 | 10                 | –                | –                  | –                |
| Zinc oxide,<br>Respirable dust  | 1314-13-2            | –                | 5                            | –                 | –                  | –                | –                  | –                |
| Total dust  |                      | –                | 10                           | –                 | –                  | –                | –                  | –                |

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS

| Substance                                      | CAS No. <sup>A</sup> | TWA              |                    | STEL <sup>D</sup> |                    | Ceiling          |                    | Skin Designation |
|--|----------------------|------------------|--------------------|-------------------|--------------------|------------------|--------------------|------------------|
|  |                      | ppm <sup>B</sup> | mg/m <sup>3C</sup> | ppm <sup>B</sup>  | mg/m <sup>3C</sup> | ppm <sup>B</sup> | mg/m <sup>3C</sup> |                  |
| Zinc stearate<br>Respirable dust<br>Total dust | 557-05-1             | –                | 5<br>10            | –                 | –                  | –                | –                  | –                |
| Zirconium compounds (as Zr)                    | 7440-67-7            | –                | 5                  | –                 | 10                 | –                | –                  | –                |

All MIOSHA Standards shown in this table are referenced in R 325.51101.

|    |  |
|----|--|
| *  | As determined from breathing-zone air samples.   |
| ** | Parts per billion.   |
| A  | The CAS number is for information only. Enforcement is based on the substance name. For an entry covering more than 1 metal compound measured as the metal, the CAS number for the metal is given - not the CAS number for the individual compounds.   |
| B  | Parts of vapor or gas per million parts of contaminated air by volume at 25 °C and 760 Torr.   |
| C  | Approximate milligrams of substance per cubic meter of air.  |
| D  | Duration is for 15 minutes, unless otherwise noted.  |
| E  | The GI & CS Part 311. “Benzene” standard applies to all occupational exposures to benzene, except some sub-segments of industry where exposures are consistently under the action level. These sub-segments include 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 sub-segments, the benzene limits in table G-2 apply. |
| F  | Caution--this rule contains extensive requirements for exposure to these substances.   |
| G  | If the exposure limit in OH Part 315. “Chromium (VI) in General Industry” is stayed or is otherwise not in effect, the exposure limit is a ceiling of 0.1 mg/m <sup>3</sup> .  |

| TABLE G-2. EXPOSURE LIMITS FOR AIR CONTAMINATES                 |   |                               |                                  |   |                  |
|---|---|-------------------------------|----------------------------------|---|------------------|
| Substance   |   | 8-hour, time-weighted average | Acceptable ceiling concentration | Acceptable maximum peak above the acceptable ceiling concentration for an 8-hour workshift. |                  |
|   |   |                               |                                  | Concentration   | Maximum duration |
| S   | Benzene <sup>E,F</sup>  | 10 ppm                        | 25 ppm                           | 50 ppm  | 10 minutes       |
| S   | Ethylene dibromide  | 20 ppm                        | 30 ppm                           | 50 ppm  | 5 minutes        |
| Note: S above signifies that skin contact shall not be allowed. |   |                               |                                  |   |                  |
| E   | The GI & CS Part 311. "Benzene" standard applies to all occupational exposures to benzene, except some sub-segments of industry where exposures are consistently under the action level. These sub-segments include 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 sub-segments, the benzene limits in this table apply. |                               |                                  |   |                  |
| F   | Caution--this rule contains extensive requirements for exposure to these substances.  |                               |                                  |   |                  |

History: 1990 AACS; 2001 AACS; 2013 AACS; 2017 AACS; 2019 AACS.