Warning Signs and Lights
Illumination
Drive Pulley.
Bottom (boot) Pulley and Clearance.
Pulley Supports.
Motor.
Driving Mechanism
Brake.
Electrical Switches
Vibration and Misalignment.
"Skip" on up or down run when mounting step (indicating worn gears).

(3) *Inspection log.* A written record shall be kept of findings at each inspection. Records of inspection shall be made available to the Assistant Secretary of Labor or his duly authorized representative.

(SOURCE: ANSI A90.1-1969 Safety Code for Manlifts.)

[37 FR 22102, Oct. 18, 1972, as amended at 38 FR 16223, June 21, 1973]

### § 1910.69 Sources of standards.

| Sec. | Source |
|---|---|
| 1910.66 | ANSI A120.1-1970 Safety Code for Powered Platforms for Exterior Building Maintenance. |
| 1910.67 | ANSI A92.2-1969, American National Standard for Vehicle-Mounted Elevating and Rotating Work Platforms. |
| 1910.68 | ANSI A90.1-1969 Safety Code for Manlifts. |

### § 1910.70 Standards organizations.

Specific standards of the following organizations have been referenced in this subpart. Copies of the standards may be obtained from the issuing organization.

American National Standards Institute, 1430 Broadway, New York, NY 10018.

## Subpart G—Occupational Health and Environmental Control

### § 1910.93 Air contaminants.

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

(a) Table G-1.

(1) *Materials with names preceded by "C"—Ceiling Values.* An employee's exposure to any material in table G-1, the name of which is preceded by a "C" (e.g., C Boron trifluoride), shall at no time exceed the ceiling value given for that material in the table.

(2) *Other materials—8-hour time weighted averages.* An employee's exposure to any material in table G-1, the name of which is not preceded by "C", in any 8-hour work shift of a 40-hour work week, shall not exceed the 8-hour time weighted average given for that material in the table.

(b) Table G-2:

(1) *8-hour time weighted averages.* An employee's exposure to any material listed in table G-2, in any 8-hour work shift of a 40-hour work week, shall not exceed the 8-hour time weighted average limit given for that material in the table.

(2) *Acceptable ceiling concentrations.* An employee's exposure to a material listed in table G-2 shall not exceed at any time during an 8-hour shift the acceptable ceiling concentration limit given for the material in the table, except for a time period, and up to a concentration not exceeding the maximum duration and concentration allowed in the column under "acceptable maximum peak above the acceptable ceiling concentration for an 8-hour shift".

(3) *Example.* During an 8-hour work shift, an employee may be exposed to a concentration of Benzene above 25 p.p.m (but never above 50 p.p.m.) only for a maximum period of 10 minutes. Such exposure must be compensated by exposures to concentrations less than 10 p.p.m. so that the cumulative exposure for the entire 8-hour work shift does not exceed a weighted average of 10 p.p.m.

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

(d) Computation formulae:

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

$$E = \frac{C_a T_a + C_b T_b + \ldots C_n T_n}{8}$$

where:

*E* is the equivalent exposure for the working shift.

*C* is the concentration during any period of time *T* where the concentration remains constant.

*T* is the duration in hours of the exposure at the concentration *C*.

The value of *E* shall not exceed the 8-hour time weighted average limit in table G-1, G-2, or G-3 for the material involved.

(ii) To illustrate the formula prescribed in subdivision (i) of this subparagraph, note that isoamyl acetate has an 8-hour time weighted average limit of 100 p.p.m. Suppose an employee is subject to the following exposure:

Two hours exposure at 150 p.p.m.
Two hours exposure at 75 p.p.m
Four hours exposure at 50 p.p.m.

Substituting this information in the formula, we have

$$\frac{2 \times 150 + 2 \times 75 + 4 \times 50}{8} = 81.25 \text{ p.p.m}$$

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

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

$$E_m = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \ldots \frac{C_n}{L_n}$$

Where:

$E_m$ is the equivalent exposure for the mixture.

*C* is the concentration of a particular contaminant.

*L* is the exposure limit for that contaminant, from table G-1, G-2, or G-3.

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

(ii) To illustrate the formula prescribed in subdivision (i) of this subparagraph, consider the following exposures:

| Material | Actual concentration of 8-hour exposure | 8-hour time weighted average exposure limit |
|---|---|---|
| Acetone (Table G-1) | 500 p.p.m. | 1,000 p.p.m. |
| 2 Butanone (Table G-1) | 45 p.p.m. | 200 p.p.m. |
| Toluene (Table G-2) | 40 p.p.m. | 200 p.p.m. |

Substituting in the formula, we have:

$$E_m = \frac{500}{1,000} + \frac{45}{200} + \frac{40}{200}$$

$$E_m = 0.500 + 0.225 + 0.200$$

$$E_m = 0.925$$

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

(e) To achieve compliance with paragraph (a) through (d) of this section, administrative or engineering controls must first be determined and implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or any other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed in this section. Any such 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. Whenever respirators are used, their use shall comply with § 1910.134.

TABLE G-1

| Substance | PPM | MG/M³ |
|---|---|---|
| Acetaldehyde | [illegible] | [illegible] |
| Acetic acid | [illegible] | [illegible] |
| Acetic anhydride | [illegible] | [illegible] |
| Acetone | 1,000 | [illegible] |
| Acetonitrile | 40 | [illegible] |
| Acetylene dichloride (see 1,2 Dichloroethylene) | | |
| Acetylene tetrabromide | [illegible] | [illegible] |
| Acrolein | [illegible] | [illegible] |
| Acrylamide—Skin | [illegible] | [illegible] |
| Acrylonitrile—Skin | [illegible] | [illegible] |
| Adipic—Skin | [illegible] | [illegible] |
| Allyl alcohol—Skin | [illegible] | [illegible] |
| Allyl chloride | [illegible] | [illegible] |
| *C Allyl glycidyl ether (AGE) | [illegible] | [illegible] |
| Allyl propyl disulfide | [illegible] | [illegible] |
| 2-Aminoethanol (see Ethanolamine) | | |
| *C Ammonia | [illegible] | [illegible] |
| Ammonium sulfamate (Ammate) | | |
| [illegible] | | |
| *C Amyl acetate | [illegible] | [illegible] |
| sec-Amyl alcohol (2-Pentanol) | [illegible] | [illegible] |
| Aniline—Skin | [illegible] | [illegible] |
| Anisidine (o,p-isomers)—Skin | | |
| Antimony and compounds, as Sb | | [illegible] |
| ANTU (alpha-naphthylthiourea) | | |
| Arsine | | |
| Arsenic and compounds, as As | | |
| Asphalt (fumes) | | |
| Atrazine—Skin | | |
| Azinphos-methyl—Skin | | |
| Azodicarbonamide | | |
| Barium, soluble compounds, as Ba | | |
| Benomyl | | |
| Benzene—Skin | [illegible] | [illegible] |
| Benzidine—Skin | | |
| Benzo(a)pyrene (see Coal tar pitch volatiles) | | |
| Benzoyl peroxide | | |
| Beryllium and compounds, as Be | [illegible] | [illegible] |
| Biphenyl (Diphenyl) | | |
| Bis(chloromethyl) ether (BCME) | | |
| Boron oxide | | |
| C Boron trifluoride | | |
| Bromacil | [illegible] | [illegible] |
| Bromine | [illegible] | [illegible] |
| Bromine pentafluoride | [illegible] | [illegible] |
| Bromoform—Skin | [illegible] | [illegible] |
| 1,3-Butadiene (see Butadiene) | | |
| Butane | [illegible] | [illegible] |
| 1-Butanol (see Butyl alcohol) | | |
| 2-Butanone (Methyl ethyl ketone) (MEK) | [illegible] | [illegible] |
| 2-Butoxyethanol (Butyl Cellosolve)—Skin | [illegible] | [illegible] |
| 2-Butoxyethanol acetate (see Butyl Cellosolve acetate) | [illegible] | [illegible] |
| n-Butyl acetate | [illegible] | [illegible] |
| sec-Butyl acetate | [illegible] | [illegible] |
| Butylamine | [illegible] | [illegible] |
| tert-Butyl chromate, as CrO3 | [illegible] | [illegible] |
| n-Butyl glycidyl ether (BGE) | [illegible] | [illegible] |
| C Butyl mercaptan | [illegible] | [illegible] |
| p-tert-Butyltoluene | [illegible] | [illegible] |
| [illegible] | | |
| [illegible] | | |
| [illegible] | |