

## RULES AND REGULATIONS

10503

(vi) *Strength of step supports.* When subjected to a load of 400 pounds applied at the approximate center of the step, step frames, or supports and their guides shall be of adequate strength to:

- (a) Prevent the disengagement of any step roller.
- (b) Prevent any appreciable misalignment.

(c) Prevent any visible deformation of the steps or its support.

(vii) *Prohibition of steps without handholds.* No steps shall be provided unless there is a corresponding handhold above or below it meeting the requirements of subparagraph (4) of this paragraph. If a step is removed for repairs or permanently, the handholds immediately above and below it shall be removed before the lift is again placed in service.

(4) *Handholds.*—(i) *Location.* Handholds attached to the belt shall be provided and installed so that they are not less than 4 feet nor more than 4 feet 8 inches above the step tread. These shall be so located as to be available on the both "up" and "down" run of the belt.

(ii) *Size.* The grab surface of the handhold shall be not less than 4½ inches in width, not less than 3 inches in depth, and shall provide 2 inches of clearance from the belt. Fastenings for handholds shall be located not less than 1 inch from the edge of the belt.

(iii) *Strength.* The handhold shall be capable of withstanding, without damage, a load of 300 pounds applied parallel to the run of the belt.

(iv) *Prohibition of handhold without steps.* No handhold shall be provided without a corresponding step. If a handhold is removed permanently or temporarily, the corresponding step and handhold for the opposite direction of travel shall also be removed before the lift is again placed in service.

(v) *Type.* All handholds shall be of the closed type.

(5) *Up limit stops.*—(i) *Requirements.* Two separate automatic stop devices shall be provided to cut off the power and apply the brake when a loaded step passes the upper terminal landing. One of these shall consist of a split-rail switch mechanically operated by the step roller and located not more than 6 inches above the top terminal landing. The second automatic stop device may consist of any of the following:

(a) Any split-rail switch placed 6 inches above and on the side opposite the first limit switch.

(b) An electronic device.

(c) A switch actuated by a lever, rod, or plate, the latter to be placed on the "up" side of the head pulley so as to just clear a passing step.

(ii) *Manual reset location.* After the manlift has been stopped by a stop device it shall be necessary to reset the automatic stop manually. The device shall be so located that a person resetting it shall have a clear view of both the "up" and "down" runs of the manlift. It shall not be possible to reset the device from any step or platform.

(iii) *Cut-off point.* The initial limit stop device shall function so that the

manlift will be stopped before the loaded step has reached a point 24 inches above the top terminal landing.

(iv) *Electrical requirements.* (a) Where such switches open the main motor circuit directly they shall be of the multipole type.

(b) Where electronic devices are used they shall be so designed and installed that failure will result in shutting off the power to the driving motor.

(c) Where flammable vapors or dusts may be present all electrical installations shall be in accordance with NFPA No. 70-1968 National Electric Code, requirements for such locations.

(d) Unless of the oil-immersed type controller contacts carrying the main motor current shall be copper to carbon or equal, except where the circuit is broken at two or more points simultaneously.

(6) *Emergency Stop.*—(i) *General.* An emergency stop means shall be provided.

(ii) *Location.* This stop means shall be within easy reach of the ascending and descending runs of the belt.

(iii) *Operation.* This stop means shall be so connected with the control lever or operating mechanism that it will cut off the power and apply the brake when pulled in the direction of travel.

(iv) *Rope.* If rope is used, it shall be not less than three-eighths inch in diameter. Wire rope, unless marlin-covered, shall not be used.

(7) *Instruction and warning signs.*—

(i) *Instruction signs at landings or belts.* Signs of conspicuous and easily read style giving instructions for the use of the manlift shall be posted at each landing or stenciled on the belt.

(a) Such signs shall be of letters not less than 1 inch in height and of a color having high contrast with the surface on which it is stenciled or painted (white or yellow on black or black on white or gray).

(b) The instructions shall read approximately as follows:

Face the Belt.  
Use the Handholds.  
To Stop—Pull Rope.

(ii) *Top floor warning sign and light.* (a) At the top floor an illuminated sign shall be displayed bearing the following wording:

"TOP FLOOR—GET OFF"

Signs shall be in block letters not less than 2 inches in height. This sign shall be located within easy view of an ascending passenger and not more than 2 feet above the top terminal landing.

(b) In addition to the sign required by subdivision (a) of this subdivision, a red warning light of not less than 40-watt rating shall be provided immediately below the upper landing terminal and so located as to shine in the passenger's face.

(iii) *Visitor Warning.* A conspicuous sign having the following legend—"AUTHORIZED PERSONNEL ONLY"—shall be displayed at each landing. The sign shall be of block letters not less than 2 inches in height and shall be of a color offering high contrast with the background color.

(d) *Operating rules.*—(1) *Proper use of manlifts.* No freight, packaged goods, pipe, lumber, or construction materials of any kind shall be handled on any manlift.

(e) *Periodic inspection.*—(1) *Frequency.* All manlifts shall be inspected by a competent designated person at intervals of not more than 30 days. Limit switches shall be checked weekly. Manlifts found to be unsafe shall not be operated until properly repaired.

(2) *Items covered.* This periodic inspection shall cover but is not limited to the following items:

Steps.  
Step Fastenings.  
Rails.  
Rail Supports and Fastenings.  
Rollers and Slides.  
Belt and Belt Tension.  
Handholders and Fastenings.  
Floor Landings.  
Guardrails.  
Lubrication.  
Limit Switches.  
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.)

#### § 1910.69 Sources of standards.

| Sec.    | Source                                                                                                 |
|---------|--------------------------------------------------------------------------------------------------------|
| '910.66 | 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. (Gases, vapors, fumes, dust, and mists.)

(a) Exposures by inhalation, ingestion, skin absorption, or contact to any material or substance (1) at a concentration above those specified in the "Threshold Limit Values of Airborne Contaminants for 1970" of the American Conference of Governmental Industrial Hygienists, listed in Table G-1, except for the American National Standards listed in Table G-2 of this section and





TABLE G-3-MINERAL DUSTS

| substance                                                                             | Mppcf <sup>1</sup> | Mg/M <sup>2</sup>                                 |
|---------------------------------------------------------------------------------------|--------------------|---------------------------------------------------|
| Silica<br>(Crystalline)<br>Quartz (total dust).....                                   | 250                | 10mg/M <sup>2</sup>                               |
| Quartz (total dust).....                                                              | $\%SiO_2=5$        | $\%SiO_2=2$<br>3mg/M <sup>2</sup>                 |
| Cristobalite. Use is the value calculated from the count or mass formulae for quartz. |                    | $\%SiO_2=2$                                       |
| Tremolite. Use is the value calculated from the formulae for quartz.                  |                    |                                                   |
| Amorphous, including natural diatomaceous earth.....                                  | 20                 | 80mg/M <sup>2</sup>                               |
| Tremolite.....                                                                        | 5                  | $\%SiO_2$<br>20mg/M <sup>2</sup>                  |
| Silicates (less than 1% crystalline silica):                                          |                    | $\%SiO_2$                                         |
| Asbestos—12 fibers per milliliter greater than 5 microns in length, or.....           | 2                  |                                                   |
| Mica.....                                                                             | 20                 |                                                   |
| Soapstone.....                                                                        | 20                 |                                                   |
| Talc.....                                                                             | 20                 |                                                   |
| Portland cement.....                                                                  | 50                 |                                                   |
| Graphite (natural).....                                                               | 15                 |                                                   |
| Coal dust (respirable fraction less than 5% SiO <sub>2</sub> ).....                   |                    | 2.4mg/M <sup>2</sup><br>or<br>10mg/M <sup>2</sup> |
| For more than 5% SiO <sub>2</sub> .....                                               |                    | $\%SiO_2+2$                                       |
| Inert or Nuisance Dust:<br>Respirable fraction.....                                   | 15                 | 5mg/M <sup>2</sup>                                |
| Total dust.....                                                                       | 50                 | 15mg/M <sup>2</sup>                               |

Note: Conversion factors—  
mppcf x 35.3 = million particles per cubic meter

<sup>1</sup> Millions of particles per cubic foot of air, based on impinger samples counted by light-field techniques.

<sup>2</sup> The percentage of crystalline silica in the formula is the amount determined from air-borne samples, except in those instances in which other methods have been shown to be applicable.

<sup>3</sup> As determined by the membrane filter method at 430 X phase contrast magnification.

<sup>4</sup> Both concentration and percent quartz for the application of this limit are to be determined from the fraction passing a size-selector with the following characteristics:

| Aerodynamic diameter (unit density sphere) | Percent passing selector |
|--------------------------------------------|--------------------------|
| 2                                          | 90                       |
| 2.5                                        | 75                       |
| 3.5                                        | 50                       |
| 5.0                                        | 25                       |
| 10                                         | 0                        |

The measurements under this note refer to the use of an AEC instrument. If the respirable fraction of coal dust is determined with a MRE the figure corresponding to that of 2.4 Mg/M<sup>2</sup> in the table for coal dust is 4.5 Mg/M<sup>2</sup>.

#### § 1910.94 Ventilation.

(a) Abrasive blasting—(1) Definitions applicable to this paragraph.—(i) Abrasive. A solid substance used in an abrasive blasting operation.

(ii) Abrasive-blasting respirator. A continuous flow air-line respirator constructed so that it will cover the wearer's head, neck, and shoulders to protect him from rebounding abrasive.

(iii) Blast cleaning barrel. A complete enclosure which rotates on an axis, or which has an internal moving tread to tumble the parts, in order to expose various surfaces of the parts of the action of an automatic blast spray.

(iv) Blast cleaning room. A complete enclosure in which blasting operations are performed and where the operator works inside of the room to operate the

blasting nozzle and direct the flow of the abrasive material.

(v) Blasting cabinet. An enclosure where the operator stands outside and operates the blasting nozzle through an opening or openings in the enclosure.

(vi) Clean air. Air of such purity that it will not cause harm or discomfort to an individual if it is inhaled for extended periods of time.

(vii) Dust collector. A device or combination of devices for separating dust from the air handled by an exhaust ventilation system.

(viii) Exhaust ventilation system. A system for removing contaminated air from a space, comprising two or more of the following elements (a) enclosure or hood, (b) duct work, (c) dust collecting equipment, (d) exhauster, and (e) discharge stack.

(ix) Particulate-filter respirator. An air-purifying respirator, commonly referred to as a dust or a fume respirator, which removes most of the dust or fume from the air passing through the device.

(x) Respirable dust. Airborne dust in sizes capable of passing through the upper respiratory system to reach the lower lung passages.

(xi) Rotary blast cleaning table. An enclosure where the pieces to be cleaned are positioned on a rotating table and are passed automatically through a series of blast sprays.

(xii) Abrasive blasting. The forcible application of an abrasive to a surface by pneumatic pressure, hydraulic pressure, or centrifugal force.

(2) Dust hazards from abrasive blasting. (i) Abrasives and the surface coatings on the materials blasted are shattered and pulverized during blasting operations and the dust formed will contain particles of respirable size. The composition and toxicity of the dust from these sources shall be considered in making an evaluation of the potential health hazards.

(ii) The concentration of respirable dust or fume in the breathing zone of the abrasive-blasting operator or any other worker shall be kept below the levels specified in § 1910.93.

(iii) Organic abrasives which are combustible shall be used only in automatic systems. Where flammable or explosive dust mixtures may be present, the construction of the equipment, including the exhaust system and all electric wiring shall conform to the requirements of American National Standard Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying, Z33.1-1961 (NFPA 91-1961), and American National Standard National Electrical Code, C1-1968 NFPA 70-1968. The blast nozzle shall be bonded and grounded to prevent the buildup of static charges. Where flammable or explosive dust mixtures may be present, the abrasive blasting enclosure, the ducts, and the dust collector shall be constructed with loose panels or explosion venting areas, located or sized away from any occupied area to provide for pressure relief in case of explosion, following the principles set forth in the National Fire Protection

Association Explosion Venting Guide, NFPA 68-1954.

(3) Blast-cleaning enclosures. (i) Blast-cleaning enclosures shall be exhaust ventilated in such a way that a continuous inward flow of air will be maintained at all openings in the enclosure, during the blasting operation.

(a) All air inlets and access openings shall be baffled or so arranged that by the combination of inward air flow and baffling the escape of abrasive or dust particles into an adjacent work area will be minimized and visible spurts of dust will not be observed.

(b) The rate of exhaust shall be sufficient to provide prompt clearance of the dust-laden air within the enclosure after the cessation of blasting.

(c) Before the enclosure is opened, the blast shall be turned off and the exhaust system shall be run for a sufficient period of time to remove the dusty air within the enclosure.

(d) Safety glass protected by screening shall be used in observation windows, where hard deep-cutting abrasives are used.

(e) Silt abrasive-resistant baffles shall be installed in multiple sets at all small access openings where dust might escape, and shall be inspected regularly and replaced when needed.

(1) Doors shall be flanged and tight when closed.

(2) Doors on blast-cleaning rooms shall be operable from both inside and outside, except that where there is a small operator access door, the large work access door may be closed or opened from the outside only.

(4) Exhaust ventilation systems. (i) The construction, installation, inspection, and maintenance of exhaust systems shall conform to the principles and requirements set forth in American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960, and ANSI Z33.1-1961.

(a) When dust leaks are noted, repairs shall be made as soon as possible.

(b) The static pressure drop at the exhaust ducts leading from the equipment shall be checked when the installation is completed and periodically thereafter to assure continued satisfactory operation. Whenever an appreciable change in the pressure drop indicates a partial blockage, the system shall be cleaned and returned to normal operating condition.

(ii) In installations where the abrasive is recirculated, the exhaust ventilation system for the blasting enclosure shall not be relied upon for the removal of fines from the spent abrasive instead of an abrasive separator. An abrasive separator shall be provided for the purpose.

(iii) The air exhausted from blast-cleaning equipment shall be discharged through dust collecting equipment. Dust collectors shall be set up so that the accumulated dust can be emptied and removed without contaminating other working areas.

(5) Personal protective equipment. (i) Only respiratory protective equipment