HEARING AND RESPIRATOR PROGRAMS - SECTION 2

Nella Davis-Ray
Michigan Department of Labor
Lansing, MI

HEALTH HAZARD CONTROL

Personal Protective Equipment

Rule 3501 - General Requirements

1. Scope. This rule applies to personal protective equipment for respiratory protection. Safety standards relating to eye and face protection, head protection, foot protection and electrical protective equipment are found in MIOSHA Occupational Safety Standards for General Industry.

2. Application. Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact. [1910.132-(a)]

3. Employee-owned equipment. Where employees provide their own protective equipment, the employer shall be responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment. [1910.132(b)]

4. Design. All personal protective equipment shall be of safe design and construction for the work to be performed. [1910.132(c)]

Rule 3502 - General Respiratory Protection

1. Permissible practice.

a. In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used pursuant to the following requirements. [1910.134 (a)(1)]

b. Respirator shall be provided by the employer when such equipment is necessary to protect the health of the employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protective program which shall include the requirements outlined in subsection (2) of this rule. [1910.134(a)(2)]

c. The employee shall use the provided respiratory protection in accordance with instructions and training received. [1910.134(a)(3)]

2. Requirements for a minimal acceptable program.

a. Written standard operating procedures governing the selection and use of respirators shall be established. [1910.134(b)(1)]

b. Respirators shall be selected on the basis of hazards to which the worker is exposed. [1910.134(b)(2)]

c. The user shall be instructed and trained in the proper use of respirators and their limitations. [1910.134(b)(3)]

d. Where practicable, the respirators should be assigned to individual workers for their exclusive use. [1910.134(b)(4)]

e. Respirators shall be regularly cleaned and disinfected. Those issued for the exclusive use of one worker should be cleaned after each day's use, or more often if necessary. Those used by more than one worker shall be thoroughly cleaned and disinfected after each use. [1910.134(b)(5)]

f. Respirators shall be stored in a convenient, clean, and sanitary location. [1910.134(b)(6)]

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h. Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained. [1910.134(b)(9)]

i. There shall be regular inspection and evaluation to determine the continued effectiveness of the program. [1910.134(b)(9)]

j. Persons should not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. The local physician shall determine what health and physical conditions are pertinent.

The respirator user's medical status should be reviewed periodically (for instance, annually). [1910.134(b)(10)]

k. Approved or accepted respirators shall be used when they are available. The respirator furnished shall provide adequate respiratory protection against the particular hazard for which it is designed in accordance with standards established by competent authorities. The U.S. Department of Interior, Bureau of Mines, and the U.S. Department of Agriculture are recognized as such authorities. Although respirators listed by the U.S. Department of Agriculture continue to be acceptable for protection against specified pesticides, the U.S. Department of the Interior, Bureau of Mines, is the agency now responsible for testing and approving pesticide respirators. [1910.134(b)(11)]

3. Selection of respirators.

a. Proper selection of respirators shall be made according to the guidance of american National Standard Practices for Respiratory Protection Z88.2–1969. [1910.134(c)]

b. Respiratory protective equipment types for certain hazards. Where the following hazards exist the equipment prescribed shall be used:

HAZARD	REQUIRED EQUIPMENT
Oxygen deficiency	Hose mask with blower Self-contained breathing apparatus
Gas, vapor, particulate contaminants	
Atmospheres immediately dangerous to life or health	Hose mask with blower Self-contained breathing apparatus Self-rescue mouthpiece respirator (for escape only)
Atmospheres not immediately dangerous to life or health	Air-line respirator Air-line abrasive blasting respirator (particulate only) Gas mask with canister or with canister and filter Hose mask with blower Respirator with chemical cartridge or filter or both

[R325.2442b]

c. Abrasive-blasting respirators. See Rule 3205(6).

4. Air quality.

a. Compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration shall be of high purity. Oxygen shall meet the requirements of the United States Pharmacopoeia for medical or breathing oxygen. Breathing air shall meet at least the requirements of the specification for Grade D breathing air as described in Compressed Gas Association Commodity Specification G-7.1-1966. compressed oxygen shall not be used in supplied-air respirators or in open-circuit self-contained breathing apparatus that have previously used compressed air. Oxygen must never be used with air-line respirators. [1910.134(d)(1)]

b. Breathing air may be supplied to respirators from cylinders or air compressors. [1910.134(d)(2)]

i. cylinders shall be tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR Part 178). [1910.134(d)(2)(i)]

ii. The compressor for supplying air shall be equipped with necessary safety and standby devices. A breathing air-type compressor shall be used. compressors shall be constructed and situated so as to avoid entry of contaminated air into the system and suitable in-line air-purifying sorbent beds and filters installed to further assure breathing air quality. A receiver of sufficient capacity to enable the respirator wearer to escape from a contaminated atmosphere in event of compressor failure, and

alarms to indicate compressor failure and overheating shall be installed in the system. If an oil=lubricated compressor is used, it shall have a high-temperature or carbon monoxide alarm, or both. If only a high-temperature alarm is used, the air from the compressor shall be frequently tested for carbon monoxide to insure that it meets the specifications in paragraph (a) of this subsection. [1910.134(d)(2)(ii)]

c. Air-line couplings shall be incompatible with outlets for other gas systems to prevent inadvertent servicing of air-line respirators with nonrespirable gases or oxygen. [1910.134(d)(3)]

d. Breathing gas containers shall be marked in accordance with American National Standard Method of Marking portable Compressed Gas Containers to Identify the Material Contained, Z48.1-1954; Federal Specification BB-A-1034a, June 21, 19658, Air, Compressed for Breathing Purposes; or Interim Federal Specification GG-B0--675b, April 27, 1965, Breathing Apparatus, Self-Contained. [1910.134(d)(4)]

e. A self-contained breathing apparatus and universal type gas mask shall incorporate an audible or visible alarm, or window to indicate impending failure to the device to provide respirable air. It is recommended that warning be given when 20-25% of rated service time remains. [R325.2442c(6)]

5. Use of respirators.

a. Standard procedures shall be developed for respirator use. These should include all information and guidance necessary for their proper selection, use, and care. Possible emergency and routine uses of respirators should be anticipated and planned for. [1910.134(e)(1)]

b. The correct respirator shall be specified for each job. The respirator type is usually specified in the work procedures by a qualified individual supervising the respiratory protective program. The individual supervising the respiratory protective program. The individual issuing them shall be adequately instructed to insure that the correct respirator is issued. Each respirator permanently assigned to an individual should be durably marked to indicate to whom it was assigned. This mark shall not affect the respirator performance in any way. The date of issuance should be recorded [1910.134(e)(2)]

c. For use of respirators in atmospheres immediately dangerous to life or health, see Rule 3302.

d. Respiratory protection is no better than the respirator in use, even though it is worn conscientiously. Frequent random inspections shall be conducted by a qualified individual to assure that respirators are properly selected, used, cleaned, and maintained. [1910.134(e)(4)]

e. For safe use of any respirator, it is essential that the user be properly instructed in its selection, use, and maintenance. Both supervisors and workers shall be so instructed by competent persons. Training shall provide the men an opportunity to handle the respirator, have it fitted properly, test its facepiece-to-face seal, wear it in normal air for a long familiarity period, and, finally, to wear it in a test atmosphere. [1910.134(e)(5)]

i. Every respirator wearer shall receive fitting instructions including demonstrations and practice in how the respirator should be worn, how to adjust it, and how to determine if it fits properly. Respirators shall not be worn when conditions prevent a good face seal. Such conditions may be a growth of beard, sideburns, a skullcap that projects under the facepiece, or temple pieces on glasses. Also, the absence of one or both dentures can seriously affect the fit of a facepiece. The worker's diligence in observing these factors shall be evaluated by periodic check. To assure proper protection, the facepiece fit shall be checked by the wearer each time he puts on the respirator. This may be done by following the manufacturer's facepiece-fitting instructions. [1910.134(e)(5)(i)]

ii. Providing respiratory protection for individuals wearing corrective glasses is a serious problem. A proper seal cannot be established if the temple bars of eyeglasses extend through the sealing edge of the full facepiece. As a temporary measure, glasses with short temple bars or without temple bars may be taped to the wearer's head. Wearing of contact lenses in contaminated atmospheres with a respirator shall not be allowed. Systems have been developed for mounting corrective lenses inside full facepieces. When a workman must wear corrective lenses as part of the facepiece, the facepiece and lenses shall be fitted by qualified individuals to provide good vision, comfort, and a gas-tight seal. [1910.134(e)(5)(ii)]

iii. If corrective spectacles or goggles are required, they shall be worn so as not to affect the fit of the facepiece. Proper selection of equipment will minimize or avoid this problem. [1910.134(e)(5)(iii)]

iv. A worker shall use the equipment in accordance with instructions, shall report any malfunctioning of the equipment against damage. [R325.2442(6)]

6. Maintenance and care of respirators.

a. A program for maintenance and care of respirators shall be adjusted to the type of plant, working conditions, and hazards involved, and shall include the following basic services:

i. Inspection for defects (including a leak check),

ii. Cleaning and disinfection,

iii. Repair,

iv. Storage.

Equipment shall be properly maintained to retain its original effectiveness. [1910.134(f)(1)]

b.

i. All respirators shall be inspected routinely before and after each use. A respirator that is not routinely used but is kept ready for emergency use shall be inspected after each use and at least monthly to assure that it is in satisfactory working condition. [1910.134(f)(2)(i)]

ii. Self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be fully charged according to the manufacturer's instructions. It shall be determined that the regulator and warning devices function properly. [1910.134(f)(2)(ii)]

iii. Respirator inspection shall include a check of the tightness of connections and the condition of the facepiece, headbands, valves, connecting tube, and canisters. Rubber or elastomer parts shall be inspected for pliability and signs of deterioration. Stretching and manipulating rubber or elastomer parts with a massaging action will keep them pliable and flexible and prevent them from taking a set during storage. [1910.134(f)(2)(iii)]

iv. A record shall be kept of inspection dates and findings for respirators maintained for emergency use. [1910.134(f)(2)(iv)]

c. Routinely used respirators shall be collected, cleaned, and disinfected as frequently as necessary to insure that proper protection is provided for the wearer. Each worker should be briefed on the cleaning procedure and be assured that he will always receive a clean and disinfected respirator. Such assurances are of greatest significance when respirators are not individually assigned to workers. Respirators maintained for emergency use shall be cleaned and disinfected after each use. [1910.134(f)(3)]

d. Replacement or repairs shall be done only by experienced persons with parts designed for the respirator. No attempt shall be made to replace components or to make adjustment or repairs beyond the manufacturer's recommendations. Reducing or admission valves or regulators shall be returned to the manufacturer or to a trained technician for adjustment or repair. [1910.134(f)(4)]

e.

i. After inspection, cleaning, and necessary repair, respirators shall be stored to protect against dust, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals. Respirators placed at stations and work areas for emergency use should be quickly accessible at all times and should be stored in compartments built for the purpose. The compartments should be clearly marked. Routinely used respirators, such as dust respirators, may be placed in plastic bags. Respirators should not be stored in such places as lockers or tool boxes unless they are in carrying cases or cartons. [1910.134(f)(5)(i)]

ii. Respirators should be packed or stores so that the facepiece and exhalation valve will rest in a normal position and function will not be impaired by the elastomer setting in an abnormal position. [1910.134(f)(5)(ii)]

iii. Instructions for proper storage of emergency respirators, such as gas masks and self-contained breathing apparatus, are found in "use and care" instructions usually mounted inside the carrying case lid. [1910.134(f)(5)(iii)]

7. Identification of gas mask canisters.

a. The primary means of identifying a gas mask canister shall be by means of properly worded labels. The secondary means of identifying a gas mask canister shall be by a color code. [1910.134(g)(1)]

b. All who issue or use gas masks falling within the scope of this section shall see that all gas mask canisters purchased or used by them are properly labeled and colored in accordance with these requirements before they are placed in service and that the labels and colors are properly maintained at all times thereafter until the canisters have completely served their purpose. [1910.134(g)(2)]

c. On each canister shall appear in bold letters the following:

i.

Canister for .....
(Name for atmospheric contaminant)
or
Type N Gas Mask Canister
[1910.134(g)(3)(i)]

ii. In addition, essentially the following wording shall appear beneath the appropriate phrase on the canister label: "For respiratory protection in atmospheres containing not more than .....percent by volume of (Name of Atmospheric Contaminant)." [1910.134(g)(3)(ii)]

iii. All of the markings specified above should be placed on the most conspicuous surface or surfaces of the canister. [1910.134(g)(3)(iii)]

d. Canisters having a special high-efficiency filter for protection against radionuclides and other highly toxic particulates shall be labeled with a statement of the type and degree of protection afforded by the filter. The label shall be affixed to the neck end of, or to the gray stripe which is around and near the top of, the canister. The degree of protection shall be marked as the percent of penetration of their canister by a 0.3-micron diameter dioctyl phthalate (DOP) smoke at a flowrate of 85 liters per minute. [1910.134(g)(4)]

e. Each canister shall have a label warning that gas masks should be used only in atmospheres containing sufficient oxygen to support life (at least 16 percent by volume), since gas mask canisters are only designed to neutralize or remove contaminants from the air. [1910.134(g)(5)]

f. Each gas mask canister shall be painted a distinctive color or combination of colors indicated in Table I-1. All colors used shall be such that they are clearly identifiable by the user and clearly distinguishable from one another. The color coating used shall offer a high degree of resistance to chipping, scaling, peeling, blistering, fading, and the effects of the ordinary atmospheres to which they may be exposed under normal

conditions of storage and use. Appropriately colored pressure-sensitive tape may be used for the stripes. [1910.134(g)(6)]

TABLE I-1

Atmospheric contaminants to be protected against	**Colors assigned***
Acid gases	White.
Hydrocyanic acid gas	White with 1/2-inch green stripe completely around the canister near the bottom.
Chlorine gas	White with 1/2-inch yellow stripe completely around the canister near the bottom.
Organic vapors	Black.
Ammonia gas	Green.
Acid gases and ammonia gas	Green with 1/2-inch white stripe completely around the canister near the bottom.
Carbon monoxide	Blue.
Acid gases and organic vapors	Yellow.
Hydrocyanic acid gas and chloropicrin vapor	Yellow with 1/2-inch blue strip completely around the canister near the bottom.
Acid gases, organic vapors, and ammonia gases.	Brown.
Radioactive materials, excepting tritium and noble gases.	Purple (Magenta).
Particulates (dusts, fumes, mists, fogs, or smokes) in combination with any of the above gases or vapors.	Canister color for contaminant, as designated above, with 1/2-inch gray stripe completely around the canister near the top.
All of the above atmospheric contaminants.	Red with 1/2-inch gray stripe completely around the canister near the top.

*Gray shall not be assigned as the main color for a canister designed to remove acids or vapors.

NOTE: Orange shall be used as a complete body, or stripe color to represent gases not included in this table. The user will need to refer to the canister label to determine the degree of protection the canister will afford.

[1910.134]