

228.2

7.4. Training and Education in Proper Use. 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.

Minimum training shall include the following:

- (1) Instruction in the nature of the hazard, whether acute, chronic, or both, and an honest appraisal of what may happen if the respirator is not used.
- (2) Explanation of why more positive control is not immediately feasible. This shall include recognition that every reasonable effort is being made to reduce or eliminate the need for respirators.
- (3) A discussion of why this is the proper type of respirator for the particular purpose.
- (4) A discussion of the respirator's capabilities and limitations.
- (5) Instruction and training in actual use of the respirator (especially a respirator for emergency use) and close and frequent supervision to assure that it continues to be properly used.
- (6) Classroom and field training to recognize and cope with emergency situations.
- (7) Other special training as needed for special use.

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.

DO 078167
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Table 4
Capabilities and Limitations of Respirators

Atmosphere-Supplying Respirators	Air-Purifying Respirators
(See 5.3 for specifications on respirable atmospheres.)	
Atmosphere-supplying respirators provide protection against oxygen deficiency and most toxic atmospheres. The breathing atmosphere is independent of ambient atmospheric conditions.	General Limitations: Air-purifying respirators do not protect against oxygen-deficient atmospheres nor against skin irritation by, or sorption through the skin of, airborne contaminants. See 6.3.1. and 6.3.5.1.
General Limitations: Except for the supplied-air suit, no protection is provided against skin irritation by materials such as Ammonia and HCl, or against sorption of materials such as HCN, tritium, or organic phosphate pesticides through the skin. See 6.3.5.1. Facepieces present special problems to individuals required to wear prescription lenses (see 9.1 and 9.2).	The maximum contaminant concentration against which an air purifying respirator will protect is determined by the designed efficiency and capacity of the cartridge, canister, or filter. For gases and vapors and for particles having a TLV of less than 0.1 mg/m³, the maximum concentration for which the air purifying unit is designed is specified on the label. Respirators without a blower to maintain a constant positive pressure within the facepiece will not provide the maximum design protection specified unless the facepiece is carefully fitted to the wearer's face to prevent inward leakage. See 7.5. The time period over which protection is provided is dependent on canister, cartridge, or filter type, concentration of contaminant, and the wearer's respiratory rate.
Self-Contained Breathing Apparatus (SCBA)	The proper type of canister, cartridge, or filter shall be selected for the particular atmosphere and conditions. Air-purifying respirators generally cause discomfort and objectionable resistance to breathing although these problems are minimized in blower-operated units. Respirator facepieces present special problems to individuals required to wear prescription lenses. (See 9.1 and 9.2.) These devices do have the advantage of being small, light, and simple in operation.
The wearer carries his own breathing atmosphere. Use is permissible in atmospheres immediately dangerous to life or health.	Gas- and Vapor-Removing Respirators
Limitations: The period over which the device will provide protection is limited by the amount of air or oxygen in the apparatus, the ambient atmospheric pressure (service life is cut in half by a doubling of the atmospheric pressure), and work load. A warning device shall be provided to indicate to the wearer when the service life has been reduced to a low level. Some SCBA devices have a short service life (few minutes) and are suitable only for escape (self-rescue) from an irrespirable atmosphere. Chief limitations of SCBA devices are their weight or bulk or both, limited service life, and the training required for their maintenance and safe use.	Additional Limitations: No protection is provided against particulate contaminants, unless specified on canister or cartridge label. A rise in canister or cartridge temperature indicates that a gas or vapor is being removed from the inspired air. This is not a reliable indicator of canister performance. An uncomfortably high temperature indicates a high concentration of gas or vapor and requires an immediate return to fresh air.
Hose Mask or Air-line Respirator	Particulate-Removing Respirators
The respirable air supply is not limited to the quantity the individual can carry, and the devices are light weight and simple.	Additional Limitations: Protect against non-volatile particles only. No protection against gases and vapors.
Limitations: The wearer is restricted in movement by the hose or air-line and must return to a respirable atmosphere by retracing his route of entry. The hose or air-line is subject to being severed or pinched off.	The filter shall be replaced or cleaned when breathing becomes difficult due to plugging by retained particles.
(1) Hose Mask	These respirators shall not be used during shot and sand blasting operations. Abrasive-blasting respirators shall be used.
(a) Hose mask with blower. If the blower fails, the unit still provides protection, although a negative pressure exists in the facepiece during inhalation. Use is permissible in atmospheres immediately dangerous to life or health.	(1) Full Facepiece Respirator
(b) Hose mask without blower. Limited to use in atmospheres from which the wearer can escape unharmed without aid of the respirator.	Should avoid use in atmospheres immediately dangerous to life or health if the contaminant(s) lacks sufficient warning properties (that is, odor or irritation).
(2) Air-Line Respirators (Continuous-Flow, Demand and Pressure-Demand Types)	
The demand type produces a negative pressure in the facepiece on inhalation whereas continuous flow and pressure-demand types maintain	
(1) Closed-circuit SCBA	
The closed circuit operation conserves oxygen and permits longer service life.	

FOR RESPIRATORY PROTECTION

(2) Open-circuit SCBA—demand and pressure-demand

The demand type produces a negative pressure in the facepiece on inhalation whereas the pressure-demand type maintains a positive pressure in the facepiece and is less apt to permit inward leakage of contaminants.

a positive pressure in the facepiece at all times and are less apt to permit inward leakage of contaminants.

Limitations: Air-line respirators are limited to use in atmospheres not immediately dangerous to life or health except under conditions specified in 6.3.2 and 7.3. Air-line respirators provide no protection if the air supply fails.

(3) Supplied-Air Suit

These suits protect against atmospheres that affect the skin or mucous membranes or that may be absorbed through the unbroken skin.

Limitations: Some contaminants, such as tritium, may penetrate the suit material and limit its effectiveness. Other contaminants, such as fluorine, may react chemically with the suit material and damage it. See 6.3.5.1.

These suits are limited in use to atmospheres not immediately dangerous to life or health except under the conditions specified in 6.3.2 and 7.3.

Combination Self-Contained and Air-Line Respirators

The equipping of an air-line respirator with a small cylinder of compressed air to provide an emergency air supply qualifies the respirator for use in immediately dangerous atmospheres. See 6.3.2.

Combination Atmosphere-Supplying and Air-Purifying Respirators

The advantages and disadvantages, expressed above, of the mode of operation being used will govern. The mode with the greater limitations (air-purifying mode) will mainly determine the overall capabilities and limitations of the respirator since the wearer may for some reason fail to change the mode of operation even though conditions would require such change.

(2) Half-Mask Respirator (Chemical-Cartridge Respirator)

Shall not use in atmospheres immediately dangerous to life or health and should be limited to low concentrations of gases and vapors. A fabric covering shall not be worn on the facepiece since it will permit gases and vapors to pass.

No protection is provided to the eyes.

(3) Mouthpiece Respirator (Chemical Cartridge)

Shall not be used in atmospheres immediately dangerous to life or health. Mouth breathing prevents detection of contaminants by odor. The nose clip shall be securely in place to prevent nasal breathing.

No protection is provided to the eyes.

(4) Self-Rescue Mouthpiece Respirator

Designed for self-rescue from immediately dangerous atmospheres of gases and vapors. Mouth breathing prevents detection of contaminants by odor. The nose clip shall be securely in place to prevent nasal breathing.

No protection is provided to the eyes.

Combination Particulate and Vapor- and Gas-Removing Respirators

The advantages and disadvantages of the component parts of the combination respirator as described above will apply.

(2) Half-Mask Respirator

Shall not be used in atmospheres immediately dangerous to life or health. A fabric covering on the facepiece is permissible only in atmospheres of coarse dusts and mists of low toxicity.

No protection is provided to the eyes.

(3) Mouthpiece Respirator (Filter)

Shall not be used in atmospheres immediately dangerous to life or health. Mouth breathing prevents detection of contaminants by odor. The nose clip shall be securely in place to prevent nasal breathing.

No protection is provided to the eyes from irritating aerosols.

(4) Self-Rescue Mouthpiece Respirator (Filter)

Designed for self-rescue from atmospheres having immediately dangerous concentrations of toxic particles. Mouth breathing prevents detection of contaminants by odor. The nose clip shall be securely in place to prevent nasal breathing.

No protection is provided to the eyes from irritating aerosols.

7.5 Facepiece Fit Tests and Procedures.

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 skull cap 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 checks.

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 such as these two simple field tests:

(1) **Positive Pressure Test.** Close the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators, this method of leak testing requires that the wearer first remove the exhalation valve cover and then carefully replace it after the test.

(2) **Negative Pressure Test.** Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is probably satisfactory.

8. Maintenance and Care of Respirators

8.1 General. 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:

- (1) inspection for defects (including a leak check)
- (2) cleaning and disinfecting
- (3) repair
- (4) storage

Equipment shall be properly maintained to retain its original effectiveness.

8.2 Inspection. 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.

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.

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.

8.3 Cleaning and Disinfection. 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.

The following procedure is recommended for cleaning and disinfecting respirators:

- (1) Remove any filters, cartridges, or canisters.
- (2) Wash facepiece and breathing tube in cleaner-disinfectant or detergent solution (see following paragraphs). Use a hand brush to facilitate removal of dirt.
- (3) Rinse completely in clean, warm water.
- (4) Air dry in a clean area.
- (5) Clean other respirator parts as recommended by manufacturer.
- (6) Inspect valves, headstraps, and other parts; replace with new parts if defective.
- (7) Insert new filters, cartridges, or canisters; make sure seal is tight.
- (8) Place in plastic bag or container for storage.

Cleaner-disinfectant solutions are available that effectively clean the respirator and contain a bactericidal agent. The bactericidal agent is generally a quaternary ammonium compound. The respirator may be immersed in the solution, rinsed in clean, warm water, and air dried.

8.4 Repair. 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.

8.5 Storage. 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 stored in compartments built for the purpose, be quickly accessible at all times, and 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.

Respirators should be packed or stored 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.

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.

DO 078174
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**DOCUMENTATION REQUIREMENTS
(RECORD KEEPING)**

**SELECTION CRITERIA
INSTRUCTIONS FOR USE**

**SOPs
SOPs**

**EMPLOYEE TRAINING
PROGRAM SURVEILLANCE
EMERGENCY RESPIRATOR INSPECTION
(MONTHLY)
DATE OF ISSUE**

**PLANT RECORDS
PLANT RECORDS
PLANT RECORDS
PLANT RECORDS**

SCBA TRAINING

SAFETY DEPT. RECORDS

EMPLOYEE FIT-TESTING

I.H. RECORDS

PHYSICAL ABILITY

MEDICAL

Subpart I—Personal Protective Equipment

§ 1910.132 General requirements.

Respiratory devices

(a) *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.

Inhalation

Employer responsibility

(b) *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.

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

§ 1910.133 Eye and face protection.

(a) *General.* (1) Protective eye and face equipment shall be required where there is a reasonable probability of injury that can be prevented by such equipment. In such cases, employers shall make conveniently available a type of protector suitable for the work to be performed, and employees shall use such protectors. No unprotected person shall knowingly be subjected to a hazardous environmental condition. Suitable eye protectors shall be provided where machines or operations present the hazard of flying objects, glare, liquids, injurious radiation, or a combination of these hazards.

(2) Protectors shall meet the following minimum requirements:

(i) They shall provide adequate protection against the particular hazards for which they are designed.

(ii) They shall be reasonably comfortable when worn under the designated conditions.

(iii) They shall fit snugly and shall not unduly interfere with the movements of the wearer.

(iv) They shall be durable.

(v) They shall be capable of being disinfected.

(vi) They shall be easily cleanable.
(vii) Protectors should be kept clean and in good repair.

(3) Persons whose vision requires the use of corrective lenses in spectacles, and who are required by this standard to wear eye protection, shall wear goggles or spectacles of one of the following types:

(i) Spectacles whose protective lenses provide optical correction.

(ii) Goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles.

(iii) Goggles that incorporate corrective lenses mounted behind the protective lenses.

(4) Every protector shall be distinctly marked to facilitate identification only of the manufacturer.

(5) When limitations or precautions are indicated by the manufacturer, they shall be transmitted to the user, and care taken to see that such limitations and precautions are strictly observed.

(6) Design, construction, testing, and use of device for eye and face protection shall be in accordance with American National Standard for Occupational and Educational Eye and Face Protection, Z87.1-1968.

§ 1910.134 Respiratory protection.

(a) *Permissible practice.* (1) 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.

(2) Respirators 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 paragraph (b) of this section.

(3) The employee shall use the provided respiratory protection in accord-

Engineering controls

Respirator protection allowed

Respirators provided

Use procedure

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DO 078176
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	ance with instructions and training received.	agency now responsible for testing and approving pesticide respirators.	
Standard operating procedures	(b) <i>Requirements for a minimal acceptable program.</i> (1) Written standard operating procedures governing the selection and use of respirators shall be established.	(c) <i>Selection of respirators.</i> Proper selection of respirators shall be made according to the guidance of American National Standard Practices for Respiratory Protection Z88.2-1969.	Selection
Selection	(2) Respirators shall be selected on the basis of hazards to which the worker is exposed.	(d) <i>Air quality.</i> (1) 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.	Breathing atmosphere quality
Instruction and training	(3) The user shall be instructed and trained in the proper use of respirators and their limitations.	(2) Breathing air may be supplied to respirators from cylinders or air compressors.	Caution — <u>OXYGEN</u>
Exclusive use	(4) Where practicable, the respirators should be assigned to individual workers for their exclusive use.	(i) Cylinders shall be tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR Part 178).	Breathing atmosphere sources
Cleaning of and disinfection	(5) 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.	(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 subparagraph (1) of this paragraph.	Cylinder testing
Storage	(6) Respirators shall be stored in a convenient, clean, and sanitary location.	(3) 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.	Compressor safety and standby devices
Inspection	(7) Respirators used routinely shall be inspected during cleaning. Worn or deteriorated parts shall be replaced. Respirators for emergency use such as self-contained devices shall be thoroughly inspected at least once a month and after each use.	(4) Breathing gas containers shall be marked in accordance with American	Compressor inlet
Emergency use*	(8) Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.		Filters
Work area surveillance	(9) There shall be regular inspection and evaluation to determine the continued effectiveness of the program.		Receiver capacity
Program evaluation	(10) 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).		Alarms
Physical ability	(11) 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		Coupling incompatibility
Adequate respirator			Cylinder markings

*Records required for Emergency Respirators.

**U.S. Department of Agriculture never did respirators.

	National Standard Method of Marking Portable Compressed Gas Containers to Identify the Material Contained, Z48.1-1954; Federal Specification BB-A-1034a, June 21, 1968, Air, Compressed for Breathing Purposes; or Interim Federal Specification GG-B-00675b, April 27, 1965, Breathing Apparatus, Self-Contained.	provisions for the rescue of persons from hazardous atmospheres shall be used. A standby man or men with suitable self-contained breathing apparatus shall be at the nearest fresh air base for emergency rescue.	Stand-by person and SCBA
Standard procedures and selection	(e) <i>Use of respirators.</i> (1) 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.	(4) 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.	Random inspections
Correct respirator to be issued	(2) 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 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.	(5) 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 face-piece-to-face seal, wear it in normal air for a long familiarity period, and, finally, to wear it in a test atmosphere.	Instruction and training
Permanent assignment marking	(3) Written procedures shall be prepared covering safe use of respirators in dangerous atmospheres that might be encountered in normal operations or in emergencies. Personnel shall be familiar with these procedures and the available respirators.	(1) 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 skull cap 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.	Fitted, fit-test, wear
Written procedures	(1) In areas where the wearer, with failure of the respirator, could be overcome by a toxic or oxygen-deficient atmosphere, at least one additional man shall be present. Communications (visual, voice, or signal line) shall be maintained between both or all individuals present. Planning shall be such that one individual will be unaffected by any likely incident and have the proper rescue equipment to be able to assist the other(s) in case of emergency.	(ii) Providing respiratory protection for individuals wearing corrective glasses is a serious problem. A proper seal cannot be established if the temple bars of eye glasses 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.	Fitting and wearing
Stand-by person			Face seal
Communication			
Rescue equipment			Corrective glasses
Stand-by person	(ii) When self-contained breathing apparatus or hose masks with blowers are used in atmospheres immediately dangerous to life or health, standby men must be present with suitable rescue equipment.		Contact lenses
Rescue equipment	(iii) Persons using air line respirators in atmospheres immediately hazardous to life or health shall be equipped with safety harnesses and safety lines for lifting or removing persons from hazardous atmospheres or other and equivalent		

Maintenance program	(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. (f) <i>Maintenance and care of respirators.</i> (1) 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 disinfecting. (iii) Repair, (iv) Storage Equipment shall be properly maintained to retain its original effectiveness. (2) (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. (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. (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. (iv) A record shall be kept of inspection dates and findings for respirators maintained for emergency use. (3) 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. (4) 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. (5) (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. (ii) Respirators should be packed or stored 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. (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. (g) <i>Identification of gas mask canisters.</i> (1) 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. (2) 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. (3) On each canister shall appear in bold letters the following: (i) — Canister for ----- (Name for atmospheric contaminant) or Type N Gas Mask Canister (ii) In addition, essentially the following wording shall appear beneath the appropriate phrase on the canister	Manufacturer's recommendations Regulator maintenance Storage Storage, facepiece, exhalation valve Instructions, storage Identification: gas mask canister Purchase, labels and color Wording
Inspection routine, monthly			
Inspection SCBA Cylinder charge			
Inspection of components			
Inspection records — emergency respirators			
Clean, disinfect			
Maintenance persons qualified			

label: "For respiratory protection in atmospheres containing not more than _____ percent by volume of _____"
 (Name of atmospheric contaminant)
 (iii) All of the markings specified above should be placed on the most conspicuous surface or surfaces of the canister.
 (4) 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 the canister by a 0.3-micron-diameter dioctyl phthalate (DOP) smoke at a flow rate of 85 liters per minute.

(5) 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.

(6) 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.

Warning, oxygen content

Canister colors

Color durability

TABLE I-1

Atmospheric contaminants to be protected against	Colors assigned*
Acid gases.....	White.
Hydrocyanic acid gas.....	White with ½-inch green stripe completely around the canister near the bottom.
Chlorine gas.....	White with ½-inch yellow stripe completely around the canister near the bottom.
Organic vapors.....	Black.
Ammonia gas.....	Green.
Acid gases and ammonia gas.....	Green with ½-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 ½-inch blue stripe 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 ½-inch gray stripe completely around the canister near the top.
All of the above atmospheric contaminants.....	Red with ½-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.

§ 1910.135 Occupational head protection.

Helmets for the protection of heads of occupational workers from impact and penetration from falling and flying objects and from limited electric shock and burn shall meet the requirements and specifications established in American

National Standard Safety Requirements for Industrial Head Protection, Z89.1-1969.

§ 1910.136 Occupational foot protection.

Safety-toe footwear for employees shall meet the requirements and specifications in American National Stand-