

RESPIRATORY PROTECTION PROGRAM

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SECTION I

SUMMARY OF COMPLIANCE STRATEGIES

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RESPIRATORY PROTECTION PROGRAM

REQUIREMENTS	RESPONSIBILITY
1) Develop, implement and maintain written Respiratory Protection Program.	EMC/SCHOOL DISTRICT
2) Provide training for all affected employees.	EMC
3) Conduct medical surveillance for all affected employees annually.	SCHOOL DISTRICT
4) Conduct fit testing for all affected employees.	EMC
5) Provide proper respiratory protection equipment at no cost to the employee.	SCHOOL DISTRICT
6) Retain medical surveillance and fit test records for a period of 30 years past termination of employment.	SCHOOL DISTRICT

SECTION II

RESPIRATORY PROTECTION PROGRAM

RESPIRATORY PROTECTION PROGRAM

Reference Standard: OSHA 29 CFR 1910.134
as adopted by COMM 32

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PURPOSE

It is the policy of the School District to provide its employees with a safe and healthy working environment. This is accomplished as far as feasible with accepted engineering and/or administrative controls. Where these methods are not feasible, respiratory protection will be provided at not cost to employees to reduce employee exposure to hazardous airborne particulates and/or gases and vapors to acceptable levels.

SCOPE/APPLICATION

This program applies to all employees who are exposed or potentially exposed to atmospheres at or above the OSHA prescribed action level for airborne contaminants per 1910.1000.

EMPLOYER RESPONSIBILITIES

- Identification and location of hazardous exposures.
- Develop, implement and maintain program.
- Review program annually to determine the continued effectiveness.
- Train employees.
- Conducted annual medical surveillance.
- Select and provide respirators based on hazard.
- Conduct annual fit testing.
- Retain records for a period of 30 years past termination of employment.

EMPLOYEE RESPONSIBILITIES:

- Employees shall use the provided respiratory protection in accordance with the instructions and training received.
- Respirators shall be thoroughly cleaned and disinfected.
- Respirators shall be stored in a convenient, clean, and sanitary location.
- Respirators shall be inspected after each use for worn or deteriorated parts.

DISCIPLINARY ACTION:

- Failure to comply with this program will result in disciplinary action.

MEDICAL REQUIREMENTS:

- Employees will not be assigned to tasks requiring the use of respirators unless it has been determined that they are physically able to perform the work and use the equipment.
- Determination must be made by a physician and may include;
 1. OSHA medical questionnaire
 2. Pulmonary Function Test
 3. Chest X-ray
- Medical status must be reviewed by the physician annually.

SELECTION AND USE OF EQUIPMENT

- Selection of proper respirators shall be based on the following factors
 1. Nature and extent of hazard(s) based on exposure monitoring and the potential harmful effects of the hazard(s).
 2. Work requirements, conditions and degree of stress.
 3. Characteristics and limitations of available respirators.

- All respiratory protection chosen will be approved by:
 1. National Institute for Occupational Safety and Health. (NIOSH)
 2. ANSI standard 288.2 Practices for Respiratory Protection.
- A list of approved respirators, for each type of hazard, will be developed and posted. A copy of this list will be sent to the appropriate supervisors.
- Respirator criteria used for selection.
 1. Differentiated by Air Source.
 - (a) Atmosphere Supplying Respirators - supplies air from outside sources.
 - SCBA - Self Contain Breathing Apparatus - supplies air from a source carried by the user.
 - SAR - Supplied Air Respirators - supplies air from an outside source connected to the user by an air-line hose.
 - (b) Air Purifying Respirators - Purifies ambient air through a filtering element prior to inhalation.
 2. Differentiated by Type of Air Flow.
 - (a) Positive Pressure - maintain positive pressure in the facepiece during both inhalation and exhalation. (two types)
 - Pressure Demand - a regulator maintains positive pressure inside the respirator.
 - Continuous Flow - a continuous stream of air is supplied to the respirator at all times.
 - (b) Negative Pressure Respirator - Draws air into the facepiece via the negative pressure created by the user inhalation.
 3. Differentiated by type of Facepiece
 - (a) Full Face - covers the face from the hairline to below the chin.
 - (b) Half Face - covers the face from below the chin to over the nose and does not provide eye protection.

TYPES OF RESPIRATORS

- SCBA
 1. Self Contained Breathing Apparatus - consists of a facepiece connected by a hose and a regulator to an air source carried by the wearer.
 2. Offers protection against most types and levels of airborne contamination.
 3. Duration of use is limited to the amount of air carried and the rate of consumption.
 4. SCBA's are bulky and heavy and increase the likelihood of heat stress and may impair movement in confined spaces.

5. Employers should provide and ensure that employees carry an escape SCBA where such emergency protection may be necessary.
6. All compressed breathing gas cylinders must meet minimum US DOT requirements for interstate shipment.
7. All compressed air, compressed oxygen, liquid air, liquid oxygen used for respiration must meet all requirements of OSHA 29 CFR Part 1910.134(d).

Breathing air must also meet or exceed the requirements of Grade D breathing air as specified in the compressed gas association pamphlet G-7.1 and ANSI Z86.1-1973.

Supplied Air Respirators - SAR's - supply air (newer oxygen) to a facepiece via a supply line from a stationary source.

1. SAR's are not recommended for entry into IDLH atmospheres unless the apparatus is equipped with an escape SCBA.
 2. The air source may be compressed air cylinders or a compressor that purifies and delivers ambient air to the facepiece.
 3. All SAR couplings must be incompatible with the outlets of other gas systems used on-site to prevent a worker from connecting to an inappropriate compressed gas source.
 4. SAR's enable longer work periods than do SCBA's and are less bulky. However, the airline impairs work mobility.
 5. Airlines are vulnerable to puncture from rough or sharp surfaces, chemical permeation; damage from contact with heavy equipment, and obstruction from falling drums, etc...
 6. When in use, airlines should be kept as short as possible.
 7. 300 Feet is the longest approved hose length.
 8. Quality of ambient air must be determined when using an air compressor for an air source.
- Combination SCBA/SAR - system which can be operated as an SCBA or an SAR and can be switched manually or automatically to the opposite air source.
1. Should not be confused with an SAR with escape provisions primary difference is the length of air time supplied by the SCBA. Combination systems supply up to 60 minutes, while the escape SCBA usually supplies only five minutes.
- APR - Air Purifying Respirators - consist of a facepiece and an air purifying device.
1. These remove specific airborne contaminants (particulates, gases, vapors, fumes) from ambient air by filtration, absorption, adsorption, or chemical reaction.
 2. These are approved for use in atmospheres containing specific chemicals up to designated concentrations and **not** for IDLH atmospheres.
 3. Have limited use and can only be used when the ambient atmosphere contains sufficient oxygen (19.5 - 21.5 percent).

Conditions that exclude or may exclude use of air purifying respirators:

- * Oxygen deficiency.
 - * IDLH concentrations or specific substances.
 - * Entry into unventilated or confined area where the exposure conditions have been characterized.
 - * Presence or potential presence of unidentified contaminants.
 - * Contaminant concentrations are unknown or exceed designated maximum use concentrations(s).
 - * Identified gases or vapors have inadequate warning properties and the sorbent service life is not known and the unit has not end-of-service life (ESLI) indicator.
 - * High relative humidity (may reduce the protection offered by the sorbent).
- Air purifying respirators usually operate in the negative pressure mode, except for powered air purifying respirators (PAPR's) which maintain a positive facepiece pressure
 - There are three types of air purifying devices:
 1. Particulate filters
 2. Cartridges and canisters which contain sorbents for specific gases and vapors
 3. Combination devices.
 - Each cartridge or canister shall be used for those substances which they have been approved for.
 - The cartridge or canister must be specifically made for that respirator.
 - Most chemical sorbent canisters are imprinted with an expiration date. They may be used up to that date as long as they are not opened. Once opened, their efficiency and service life decreases.

Where a canister or cartridge is being used against gases or vapors, the appropriate device shall be used only if the chemical(s) have "adequate warning properties" (30 CFR Part 11.150). NIOSH considers a substance to have adequate warning properties when its odor, taste, or irritant effects are detectable and persistent at concentrations below the recommended exposure limit (REL). A substance is considered to have poor warning properties when its odor or irritation threshold is above the applicable exposure limit (REL). Warning properties are essential for safe use of air-purifying respirators since they allow detection of contaminant breakthrough, should it occur. While warning properties are not foolproof, because they rely on human senses which vary widely among individuals and in the same individual under varying conditions (e.g., olfactory fatigue), they do provide some indication of possible sorbent exhaustion, poor facepiece fit, or other malfunctions. OSHA permits the use of air-purifying respirators for protection provided that the service chemicals with poor warning properties provide that the service life of the sorbent is known and a safety factor has been applied or the respirator has an approved end-of-service-life indicator.

PROTECTION FACTOR

- Protection factor is a ratio of the exterior contaminant concentration to the level of contaminant found inside the respirator facepiece.
- The American National Standards Institute has determined protection factors for various types of respirators (ANSI Z88.2-1980).

<u>Type of Respirator</u>	<u>Protection Factor</u>
Half-face Negative Pressure	10
Full-face Negative pressure	50
PAPR	100
SAR-Type C	1000
SCBA	1000 +

- These protection factors should be utilized in the selection of respirators to ensure that wearers are not exposed to contaminants above allowable concentrations, ACGIH-TLV's, OSHA-PEL's, NIOSH-REL's.

- The protection factor can be compromised if:
 1. Worker has a high breathing rate.
 2. Ambient temperature is high or low.
 3. Worker has poor facepiece to face seal.

FIT TESTING

- Fit testing shall be done to determine a proper seal between the facepiece of the respirator and the face of the wearer.
- Qualitative or Quantitative fit tests shall be performed at the time of initial fitting and at least annually.

Quantitative fit tests involve a test subjects responding to a chemical challenge outside the respirator facepiece.
- Three of the most popular methods:
 1. Irritant smoke test.
 2. Odorous Vapor Test.
 3. Taste Test.
- Facepiece seal must be checked at donning and routinely by using the negative and positive pressure sealing tests:

NEGATIVE PRESSURE TEST

- This test shall be conducted on respirators equipped with tight fitting facepieces.
 1. For self-contained breathing apparatus, combination SAR/SCBA and supplied air respirators, either end of the breathing tube is blocked so that it will not allow the passage of air.
 2. For negative-pressure, air purifying respirators, the inlet opening of the respirator's cartridge(s) or filter(s) is closed off by covering with the palm of the hand(s).
 3. Wearers are instructed to inhale gently and hold their breath for at least 10 seconds.
 4. If the facepiece collapses slightly and no inward leakage of air into the facepiece is detected, it can be reasonably assumed that the respirator has been properly donned and the exhalation valve and facepiece are not leaking.

POSITIVE PRESSURE TEST

- This test can be conducted on respirators equipped with tight fitting facepieces which contain both inhalation and exhalation valves.
 1. For self-contained breathing apparatus, combination SAR/SCBA supplied air respirators, and for negative-pressure, air purifying respirators, the exhalation valve is closed off so that it will not allow the passage of air.
 2. Wearers are instructed to exhale gently for at least 10 seconds.
 3. The respirator has been donned properly if a slight positive pressure can be built up inside the facepiece without the detection of any outward leakage of air between the sealing surface of the facepiece and the wearer's face.

- Special problems which may be encountered in the warning and use of respirators.
 1. Facial Hair - prevents good seal between face and respirator.
 2. Eye Glasses - should not be used with full face respirators.
 3. Contact Lenses - Shall not be worn.
 4. Facial Deformities - can prevent a good seal.
 5. Communications - speaking can break seal, communication should be kept to a minimum.

CLEANING AND DISINFECTING RESPIRATORS

- Respirators shall be cleaned and disinfected after each use.
 1. Before leaving the work area, clean the respirator of gross contamination.
 2. Clean respirator in warm, soapy water using a brush (mild detergent should be used).
 3. If possible, use detergents with bactericide, otherwise follow with a disinfecting rinse.
 - (a) Hypochlorite solution 50 ppm (easily made by adding two tablespoons of chlorine bleach to one gallon of water).
 - (b) Aqueous solution of iodine 50 ppm (easily made by adding one teaspoon tincture iodine to one gallon of water).
 - (c) Immerse respirator for two minutes in either solution.
 4. Thoroughly rinse respiratory equipment in warm water.
 5. Allow equipment to air dry on a clean surface or hang from a horizontal wire.

STORAGE OF RESPIRATOR EQUIPMENT

- Respirators should be stored in a convenient, clean and sanitary location.
- Respirators should be protected against dust, chemicals, sunlight and excessive heat and cold.
- Respirators should be stored in a plastic bag.
 - *Respirators should be thoroughly dried before being sealed in a plastic bag.
- Thoroughly rinse respiratory equipment in warm water.
- Allow equipment to air dry on a clean surface or hang from a horizontal wire.

INSPECTION OF RESPIRATORS

- Inspection of respirator for defects must be done before and after each use.
 1. Air purifying respirators (half-mask and full facepiece)
 - (a) Rubber facepiece - check for:
 - excessive dirt (clean all dirt from facepiece)
 - cracks, tears, or holes (obtain new facepiece)
 - distortion (allow facepiece to "sit" free from any constraints and see if distortion disappears; if not, obtain new facepiece), and
 - cracked, scratched, or loose-fitting lenses (contact respirator manufacturer to see if replacement is possible; otherwise obtain new facepiece).

- (b) Headstraps - check for:
 - breaks or tears (replace headstraps)
 - loss of elasticity (replace headstraps)
 - broken or malfunctioning buckles or attachments (obtain new buckles),
 - allow the facepiece to slip (replace headstrap)
- (c) Inhalation valve, exhalation valve - check for:
 - detergent residue, dust particles, or dirt on valve or valve seat (clean residue with soap and water) cracks, tears, or distortion in the valve material or valve seat (contact manufacturer for instructions),
 - missing or defective valve cover (obtain valve cover from manufacturer).
- (d) Filter element(s) - check for:
 - proper filter for the hazard
 - approval designation
 - missing or worn gaskets (contact manufacturer for replacement)
 - worn threads - bold filter threads and facepiece threads (replace filter or facepiece)
 - cracks or dents in filter housing (replace filter)
 - missing or loose hose clamps (obtain new clamps)

2. Atmosphere - Supplying Respirators

- (a) Check facepiece, headstraps, valves, and breathing tube, as for air-purifying respirators.
- (b) Hoods, helmet, blouse, or full suite, if applicable - check for:
 - headgear suspension (adjust properly for you)
 - cracks or breaks in faceshield (replace faceshield)
 - protective screen to see that it is intact and fits correctly over the faceshield, abrasive blasting hoods, and blouses (obtain new screen)
- (c) Air supply system - check for:
 - breathing air quality
 - breaks or kinds in air supply hoses and end fitting attachments (replace hose and/or fitting)
 - tightness of connections
 - proper setting of regulators and valves (consult manufacturer's recommendations)
 - correct operation of air-purifying elements and carbon monoxide or high-temperature alarms

REPAIR OF RESPIRATORY EQUIPMENT

- All repairs to respiratory protection equipment must be done either by the manufacturer or individuals trained by the manufacturer.
- Most, if not all, equipment manufacturers supply literature which lists the components parts of their respirators and includes information on servicing. Replacement parts for respirators must be those of the manufacturer of the equipment. **SUBSTITUTIONS OF PARTS FROM A DIFFERENT BRAND OR TYPE OF RESPIRATOR, OR UNAUTHORIZED MODIFICATION, COULD DECREASE WORKER PROTECTION OR CAUSE A TOTAL LOSS OF WORKER PROTECTION. ALSO, SUCH SUBSTITUTION OF PARTS OR MODIFICATION WILL INVALIDATE THE APPROVAL OF THE RESPIRATOR, LEADING TO VIOLATION OF APPLICABLE REGULATIONS.**

TRAINING

- Worker training will include formal instruction in the use of respiratory equipment, covering the following points:
 1. Respiratory hazards and potential health effects.
 2. How respiratory contaminants enters the body and what happens when it does.
 3. How cigarette smoking increases risk of adverse health effects.
 4. Explanation of why respirators are needed.
 5. Discussion of the consequences of not wearing respirators in exposure situations from legal, health, and disciplinary perspectives.
 6. Discussion of why the respirator selected is the proper type respirator for use in a certain respiratory hazard situation.
 7. Instruction, training and actual hands-on use of the respirator to include proper fitting, practice in wearing and adjusting the respirator, testing the facepiece-to-face seal, performing job functions, and limitations of respirator use.
 8. Inspection and maintenance of the respirator.
 9. Respirator cleaning and decontamination procedures.
 10. The purpose of medical evaluation.

SECTION III

29 CFR 1910.134 (RESPIRATORY PROTECTION STANDARD)

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=12716