

RESPIRATORY PROTECTIVE EQUIPMENT AND PROCEDURES

PREFACE:

Respirators are defined as devices designed to protect the wearer from inhalation of harmful atmospheres. This procedure sets forth practices and guidance on the proper selection, use and care of respirators as applied in the Pampa Plant, to conform with Occupational Safety and Health Act Standard 29 CFR 1910.134. Adherence to appropriate procedures is absolutely necessary in order to protect the life and health of employees potentially exposed to respiratory harm and also to comply with the requirements of Federal law.

POLICY:

The use of respirator equipment in the Pampa Plant will be governed by procedures designed to afford the greatest protection to employees exposed to respiratory hazards. Respirators will be selected on the basis of specific hazards of exposure. Employees will be instructed and trained in the selection, care and use of respirators.

Respirators will be inspected, cleaned and disinfected on a regular basis and maintained in condition to be available for use when needed.

RESPONSIBILITY:

Responsibility for carrying out such a program rests with the individual (or supervision of the particular area) to whom the respirators are issued and the status of respirator equipment should be accurately reported on the monthly Housekeeping and Safety Report. Safety Section representatives will properly maintain respirators designated for emergency use and file monthly reports on condition and findings to the Safety Supervisor.

Proper assessment of work conditions will be made to determine whether effective engineering controls can eliminate or reduce exposure hazards. Since it is not always practical to effect and maintain such engineering controls, proper protective equipment will be provided and used for respiratory protection where needed. Effort should be made to eliminate the hazard before resorting to use of personal protective equipment.

Consideration should also be given to possible emergency conditions which can arise in order to assure that proper emergency control equipment and procedures are available.

INTRODUCTION:

Toxic materials can enter the body in three ways: (1) through the gastrointestinal tract, (2) through the skin and (3) through the lungs. Of these modes of entry, the lungs present the quickest and most direct avenue of entry because of their involvement with the circulatory system and the constant need of our bodies for oxygen

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to sustain life processes. Hence there are two basic respiratory hazards: (1) oxygen-deficient air, and (2) air laden with contaminants.

The normal content of oxygen in the air is 20.9 percent by volume. Oxygen concentrations below 16 percent sea-level pressure will not support combustion and are considered unsafe for human exposure because of harmful effects on bodily functions, mental processes, and coordination. At low oxygen concentrations, collapse can be immediate, without warning, and death can ensue within minutes. Current legislation requires that the oxygen percentage in a working place be not less than 19.5. It is important to remember air can become deficient in oxygen by displacement of air by other gases or by consumption of existing oxygen by chemical processes such as fire, rusting, bacterial action, etc.

Air contaminants include particulate matter in the form of discrete particles of solids or liquids, gaseous materials in the form of a true gas or vapor, or a combination of both gaseous and particulate matter.

PROCEDURES - SELECTION AND USE OF RESPIRATORS

RESPIRATOR QUALITY CONTROL:

Only equipment approved by the U.S. Bureau of Mines or National Institute for Occupational Safety and Health (NIOSH) should be selected, according to guidelines set forth in ANSI Standard Z88.2-1969.

Respiratory protective devices fall into three classes: air purifying, supplied air, and self-contained breathing apparatus.

Air purifying devices remove contaminants from the atmosphere and can be used only in atmospheres containing sufficient oxygen to sustain life (at least 16 percent by volume at sea level). The useful life of an air purifying device is dependent upon the concentration of the contaminants, the breathing volume of the wearer, and the capacity of the air purifying medium. Air purifying devices and contaminants for which they are effective include: Mechanical filter respirators for particulate matter such as non-volatile dusts, mists or metal fumes; chemical cartridge respirators for certain gases and vapors in concentrations not in excess of 0.1 percent by volume; combinations of chemical cartridges and mechanical filters where exposure is both gaseous and particulate; and gas masks for certain specific gases and vapors in concentrations up to 2 percent by volume and for particulate matter.

Supplied Air Devices deliver breathing air through a supply hose connected to the wearer's facepiece. It is imperative that the air delivered be free of contaminants. The air source must be located in clean air and monitored frequently. With the exception of Hose Masks with Blowers, these devices should be used only in atmospheres not immediately dangerous to life. The basic types of supplied air devices include: Air-line Respirators with constant flow or demand flow, and Hose Masks with or without blower.

Self-Contained Breathing Apparatus provides complete breathing protection for various periods of time based on the amount of breathing air or oxygen supplied and the breathing demand of the wearer. We have available the Scott Air Pak Demand type SCBA which will provide breathing protection in atmospheres which are, or could be, hazardous to life.

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PRECAUTION:

There is one limitation applicable to all respiratory protective equipment. Certain gases are capable of harming the body by means other than through the respiratory tract. For example, ammonia, in concentrations of approximately 3 percent or higher, can cause skin burns, particularly on moist skin. In the presence of such harmful gases, appropriate protective clothing should be worn in addition to the proper respiratory protection.

USE OF RESPIRATORS:

Mechanical Filter

Type or Make	Use
Willson "Mono Mask"	Nuisance dusts.
MSA Confo Filter Type "F"	Dusts or mists having TLV not less than 0.1 mg/M^3 or 2.4 mppcf.
3M #8710 Disposable Mask	Nuisance and respirable dusts, particle diameter 0.4 to 0.6 microns, asbestos, silica, coal

1. Not for use in vapor or gas contaminated atmosphere.
2. Select respirator for type contaminant designed for.
3. Replace filter when resistance to breathing becomes uncomfortable.
4. Make sure nose or face piece makes close fit on face.
5. After use, wash nose or face piece with warm water and soap solution, disinfect with germicidal solution and air dry. Replace filter and place in clean plastic bag, store in case or suitable box.

Chemical Filter

Willson Chemical Cartridge Full Facepiece	R-25-1000 ppm organic vapors, 10 ppm chlorine, 50 ppm hydrogen chloride, 50 ppm sulfur dioxide.
MSA Comfo-Cartridge Type "H"	Radionuclides and dusts, fumes and mists having a TLV less than 0.1 mg/M^3
AO Combination Dual Cartridge	R-51 Organic vapors not more than 0.1 percent by volume R-55 Dusts or mists not more toxic than lead or organic vapors less than 0.1 percent by volume

1. For limited protection against light concentrations (.05 percent to 0.1 percent by volume) of certain acid and alkali vapors, organic vapors and mercury vapors. Not for use in immediately dangerous atmospheres.
2. Select respirator for type contaminant designed for.
3. Return to fresh air to replace cartridge when odor, taste, nose or throat irritation is evident. Make sure nose or face piece makes close fit on face.
4. After use, wash with warm water and soap solution, disinfect with germicidal solution, air dry, and place in clean plastic bag. Store in suitable case or container.

010557

Combinations of Mechanical Filter and Chemical Cartridge

MSA Comfo Filter-Cartridge As listed above for filter and chemical cartridge.

For use where added filter capacity is needed in higher concentrations of dusts, mists. Use and care procedures same as noted above.

Gas Masks

MSA "Chest" type Specific gases and vapors up to 2 percent by volume or as specified on canister, dusts and particulate matter

MSA "Chin" type Specific gases and vapors up to 0.5 percent by volume, dusts and particulate matter

Canisters
GMA-Black with gray stripe at top. For organic vapors and dusts
GML-White with gray stripe at top, yellow stripe at bottom. For chlorine, dusts.
GMD-Green with gray stripe at top. For ammonia, dusts.

1. Because gas masks are air-purifying devices, for the sole purpose of removing contaminants from the air, they should never be used where there is a deficiency of oxygen or high gas concentration. Insure by instrument evaluation that the oxygen content of contaminated or suspect atmosphere is 19.5 percent by volume before entering. Do not use gas mask for fire fighting.
2. Check physical condition of gas mask before use; remove seal from bottom of canister.
3. Don mask chin first; tighten lower or neck straps, side straps then top strap(s).
4. Check for face seal or leaks; squeeze breathing tube and inhale slowly and hold breath. Face piece should collapse and hold for 10 seconds.
5. Canisters have an average use life of 30 minutes. Return to fresh air and check for leaks or replace canister if leakage is detected by odor, taste, eyes, nose or throat irritation or breathing resistance develops. Canisters should be replaced according to shelf-date or use-date on canister, regardless of condition.
6. After use, gas mask should be washed with warm water and soap solution, air dry and place in clean plastic bag. Store in case or suitable cabinet. Remove canister before washing to prevent ruining canister with water.
7. Gas mask canisters used for emergency purposes should be replaced after each use.

Air-Line Respirators

American Optical-Constant Flow with full face piece
Mine Safety Appliances-Constant Flow with full face piece

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1. Use only in atmospheres not immediately harmful to life or from which the wearer can escape without the use of the respirator.
2. Source of supply of breathing air is normally plant service air or cylinder of breathing air. Do not supply oxygen to air-line respirators.
3. Air supply will be monitored periodically to insure quality meets or exceeds requirement of Compressed Gas Association Specification G 7.1 for Type 1, Class D gaseous air.
4. Air-line respirators will utilize only those connections and hoses specifically designated for the purpose of supplying breathing air. Maximum hose length permissible 125 psig., regulate depending on hose length to provide a minimum of

4. cu. ft./min. volume measured at the face piece.
5. High-pressure containers used for breathing air will be clearly marked to identify contents in accordance with ANSI Standard Z48.1-1954 or Federal Spec BB-A-1034a, June 21, 1968.
6. Check condition of mask and equipment before use. Don mask chin first, tighten lower or neck straps, side straps, then top strap(s). Adjust mask air regulator to suit comfort of wearer before entering contaminated atmosphere.
7. After use, disconnect mask from air supply and clean and store as gas mask. Do not allow water to enter regulator.

Self-Contained Breathing Apparatus

Scott Air Pak - Demand Supply
 Scott Sling Pak - Demand Supply

1. For use in atmospheres immediately dangerous to life for a limited period of time, averaging 15 minutes for 25 cu.ft. tank and 30 minutes for 45 cu.ft. tank, depending on breathing requirements of wearer.

NOTE: In areas where wearer, with failure of respirator, could be overcome by a toxic or oxygen-deficient atmosphere, at least one additional man shall be present. Visual, voice or signal line communication shall be maintained between individuals present. Planning shall be such that one will be unaffected by any unlikely incident and have the proper equipment to be able to assist the other(s) in case of emergency.

2. Check regulator hose hand-connection at cylinder for tightness and open cylinder valve 1 1/2 turns, engaging valve safety lock. Check regulator pressure gauge for "full" indication.
3. Adjust head harness straps full out. Put on mask "chin first", adjust chin straps first, side straps, then top strap.
4. Test mask and hose for leaks and tightness to face by closing off breathing tube with one hand and inhale slowly. Mask should collapse if leak tight. Test exhalation valve by exhaling with hose still closed off.
5. During normal operation the emergency by-pass valve (RED KNOB) should be fully closed. It is provided for use only in event the automatic demand regulator becomes inoperative. It provides a continuous flow of air to mask "by-passing" regulator mechanism. If needed, the by-pass valve should be opened first, then regulator valve closed, and the flow of air adjusted to user's requirement.
6. During normal operation the regulator shut-off valve (YELLOW KNOB) should be fully open (turn counter-clockwise to open). Automatic ratchet device will "lock" valve in open position. In event automatic demand regulator fails, depress locking tab and close valve by turning clockwise a or emergency by-pass has been opened. Operate shut-off valves and by-pass valves with fingers. Do not use force.
7. Do not connect mask breathing tube to regulator until ready to enter contaminated area to conserve air supply. Tighten quick-connect coupling firmly with fingers.
8. After each use inspect equipment for damage. Wash mask assembly with warm water and soap solution. Rinse, disinfect with germicidal solution, air dry, and place in clean plastic bag.
9. Recharge cylinder or replace with full one.
10. Exhaust air pressure from regulator and hose by opening by-pass slightly, then close by-pass valve. Check to make sure regulator shut-off valve (YELLOW) is open.
11. Place unit in carrying case or suitable cabinet to insure readiness when needed. Keep harness straps and mask assembly straps adjusted full out.

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NOTE: Self-contained breathing apparatus shall be inspected monthly. Air cylinders shall be fully charged. It shall be determined that the regulator and warning devices function properly.

Respirator inspection shall include a check of tightness of connections and condition of face piece, head bands, valves, connecting tubes. Rubber parts shall be inspected for pliability and signs of deterioration.

A record shall be kept of inspection dates and findings for respirators maintained for emergency use. Inspection to be performed monthly by a Safety Representative who will submit a written report to the Safety Supervisor.

NOTE: Medical Surveillance -

Workers should never be assigned to any operations requiring respiratory protection until a physician has determined that they are capable physically and psychologically to perform the work using the respiratory equipment. Pre-employment physical exams might aid in such evaluation, but additional checks may be necessary to determine suitability for a specific assignment.

Should an employee have exposure to certain toxic materials certain periodic examinations such as a urinalysis or bio-assay may be necessary even though the worker wears the proper protective equipment.

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