

## ***RESPIRATORY PROTECTION***

## ***RESPIRATORY PROTECTION***

- General Respiratory Procedures
- (1) The Company shall provided respirators as necessary to protect the health of the employee.
- (2) The Company Respiratory protection program shall be updated as necessary to reflect changes in the workplace conditions that effect respirator use.

## ***RESPIRATORY PROTECTION***

- Selecting a Respirator:

- (1) The Company uses three types of respirators, Supplied-Air Respirator (SAR) or Airline Respirator, Self-Contained Breathing Apparatus (SCBA), and Air-Purifying Respirator. Each type has a specific function for which it is used.
- (2) Supplied-Air Respirator (SAR) or Airline Respirator must be used when entering a fuel tank that exhibits an IDLH condition. That is when the oxygen content is below 19.5 percent or above 23.5 percent, LEL is above 9 percent or toxic reading is above the recommended limit.
- (3) Self-Contained Breathing Apparatus (SCBA) must be available for emergency use when personnel are working in an IDLH atmosphere and Supplied-Air Respirator (SAR) or Airline Respirator is in use.

## ***RESPIRATORY PROTECTION***

- Selecting a Respirator:

- (4) All supplied air respirators used by the Company are the Positive Pressure Respirator type (continuous air flow). Pressure inside the respirator inlet covering exceeds the ambient air pressure outside the respirator. This type respirator prevents contaminants and outside atmosphere from entering the respirator in the event of respirator leakage.
- (5) Air-Purifying Respirator must be used when working with chemicals and when the Material Safety Data Sheet requires the use of a respirator when the workplace concentration exceeds the recommended TVLs.
- (6) When using an air purifying respirator with an air-purifying filter, cartridge, the selection of the type of filter element will depend on the specific hazard. Color Coding of the filter cartridge identifies their intended use.

## ***RESPIRATORY PROTECTION***

- Qualitative Fit Test (QLFT)
- (1) The Company performs a Qualitative Fit Test (QLFT) on all personnel required to wear a respirator. This is a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to a test agent. The size respirator issued to the employee will depend on the results of the Qualitative Fit Test.
- Medical Evaluations:
  - (1) The Company will make arrangements with a physician, other licensed health care professional or medical facility to perform medical evaluation.
  - (2) Medical questionnaire are obtained from the Physician, licensed health care professional or medical facility performing the medical evaluation.

## ***RESPIRATORY PROTECTION*** **Agenda**

- Proper Care and Use of Respirators:
- Donning the Respirator. (3M 6000 Series)
- Inspecting the Respirator (3M 6000 Series)
- Cleaning and Storage of the Respirator
- Requirements for Touch-Up Painting:

## ***RESPIRATORY PROTECTION***

### **Agenda**

- Additional Procedures for Painting
- Formic Acid Strippers
- Spray Solvents / Adhesives
- Fuel Tank Entry (IDLH) Condition

## ***RESPIRATORY PROTECTION***

### **Glossary of terms**

- Air-Purifying Respirator – Means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air purifying element.
- Demand Respirator – Means an atmosphere-supplying respirator that admits breathing air to the face piece only when a negative pressure is created inside the face piece by inhalation.

# ***RESPIRATORY PROTECTION***

## **Glossary of terms**

- Emergency Situation – Means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.
- Employee Exposure – Means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

# ***RESPIRATORY PROTECTION***

## **Glossary of terms**

- Filter or Air Purifying Element – Means a component used in respirators to remove solid or liquid aerosols from the inspired air.
- Filtering Face piece (Dust Mask) – Means a negative pressure particulate respirator with a filter as an integral part of the face piece or with the entire face piece composed of the filtering medium
- Fit Factor – Means a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when work.

# ***RESPIRATORY PROTECTION***

## **Glossary of terms**

- Immediately dangerous to Life or Health (IDLH) – means an atmosphere that poses and immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.
- Negative Pressure Respirator (Tight Fitting) – Means a respirator in which the air pressure inside the face piece is negative during inhalation with respect to the ambient air pressure outside the respirator.
- Oxygen Deficient Atmosphere – Means an atmosphere with an oxygen content below 19.5% by volume.

# ***RESPIRATORY PROTECTION***

## **RESPIRATORY PROTECTION**

- General Respiratory Procedures
- (1) The Company shall provide respirators as necessary to protect the health of the employee.
- (2) The Company Respiratory protection program shall be updated as necessary to reflect changes in the workplace conditions that effect respirator use.
- **The following definitions are important terms used in the respiratory protection Program.**

## RESPIRATORY PROTECTION

- Air-Purifying Respirator – Means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air purifying element.
- Atmosphere-Supplying Respirator – Means a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied air respirators (SAR) and self-contained breathing apparatus (SCBA) units.
- Canister or Cartridge – Means a container with a filter, sorbet, or catalyst, or combination of these items, which removes specific contaminants from the air passing through the container.
- Demand Respirator – Means an atmosphere-supplying respirator that admits breathing air to the face piece only when a negative pressure is created inside the face piece by inhalation.
- Emergency Situation – Means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.
- Employee Exposure – Means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

## RESPIRATORY PROTECTION

- End-of-Service-Life Indicator (ESLI) – Means a system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbet is approaching saturation or is no longer effective.
- Escape-Only Respirator – Means a respirator intended to be used only for emergency exit.
- Filter or Air Purifying Element – Means a component used in respirators to remove solid or liquid aerosols from the inspired air.
- Filtering Face piece (Dust Mask) – Means a negative pressure particulate respirator with a filter as an integral part of the face piece or with the entire face piece composed of the filtering medium.
- Fit Factor – Means a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator..

## RESPIRATORY PROTECTION

- **Fit Test** – Means the use of a protocol of qualitatively or quantitatively evaluate the fit of a respirator on an individual.
- **Helmet** – Means a rigid respiratory inlet covering that also provides head protection against impact and penetration.
- **High Efficiency Particulate Air (HEPA) Filter** – Means a filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.
- **Hood** – Means a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.
- **Immediately dangerous to Life or Health (IDLH)** – Means an atmosphere that poses and immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

## RESPIRATORY PROTECTION

- **Interior Structural Firefighting** – Means the physical activity of fire suppression, rescue or both, inside a building or enclosed structures which are involved in a fire situation beyond the incipient state.
- **Loose-Fitting Face piece** – Means a respirator inlet covering that is designed to form a partial seal with the face.
- **Negative Pressure Respirator (Tight Fitting)** – Means a respirator in which the air pressure inside the face piece is negative during inhalation with respect to the ambient air pressure outside the respirator.
- **Oxygen Deficient Atmosphere** – Means an atmosphere with an oxygen content below 19.5% by volume.
- **Physician or Other Licensed Health Care Professional (PLHCP)** – Means an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required.



## ***RESPIRATORY PROTECTION***

- **Positive Pressure Respirator** – Means a respirator in which the pressure inside the respirator inlet covering exceeds the ambient air pressure outside the respirator.
- **Powered Air-Purifying Respirator (PAPR)** – Means an air-purifying respirator that used a blower to force the ambient air through air-purifying elements to the inlet covering.
- **Pressure Demand Respirator** – Means a positive pressure atmosphere-supplying respirator that admits breathing air to the face piece when the positive pressure is reduced inside the face piece by inhalation.
- **Qualitative Fit Test (QLFT)** – Means a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.
- **Quantitative Fit Test (QNFT)** – Means an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

## ***RESPIRATORY PROTECTION***

- **Respiratory Inlet Covering** – Means that portion of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a face piece, helmet, hood, suit, or a mouthpiece respirator with nose clamp.
- **Self-Contained Breathing Apparatus (SCBA)** – Means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.
- **Service Life** – Means the period of time that a respirator, filter or sorbet, or other respiratory equipment provides adequate protection to the wearer.
- **Supplied-Air Respirator (SAR) or Airline Respirator** – Means an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.
- **Tight-Fitting Face Piece** – Means a respiratory inlet covering that forms a complete seal with the face.
- **User Seal Check** – Means an action conducted by the respirator user to determine if the respirator is properly seated to the face.

## RESPIRATORY PROTECTION

- Selecting a Respirator:
- (1) The Company uses three types of respirators, Supplied-Air Respirator (SAR) or Airline Respirator, Self-Contained Breathing Apparatus (SCUBA), and Air-Purifying Respirator. Each type has a specific function for which it is used.
- (2) Supplied-Air Respirator (SAR) or Airline Respirator must be used when entering fuel tank that exhibits an IDLH condition. That is when the oxygen content is below 19.5 percent or above 23.5 percent, LEL is above 9 percent or toxic reading is above the recommended limit.
- (3) Self-Contained Breathing Apparatus (SCBA) must be available for emergency use when personnel are working in an IDLH atmosphere and Supplied-Air Respirator (SAR) or Airline Respirator is in use.
- (4) All supplied air respirators used by the company are the Positive Pressure Respirator type (continuous air flow). Pressure inside the respirator inlet covering exceeds the ambient air pressure outside the respirator. This type respirator prevents contaminants and outside atmosphere from entering the respirator in the event of respirator leakage.

## RESPIRATORY PROTECTION

- (5) Air-Purifying Respirator must be used when working with chemicals and when the Material Safety Data Sheet requires the use of a respirator when the workplace concentration exceeds the recommended TVLs.
- (6) When using an air purifying respirator with an air-purifying filter, cartridge, the
  - Black – Organic Vapor
  - Green – Ammonia/Methylamine
  - Yellow – OV/AG
  - Orange – Mercury Vapor/Chlorine
  - White/Magenta – Acid Gas/P100
  - Green/Magenta – A/MA / P100
  - Olive/Magenta – Multi Gas Vapor / P100
  - White – Acid Gas
  - Olive/Black – Formaldehyde/Organic Vapor
  - Olive – Multi-Gas/Vapor
  - Black/Magenta – Organic Vapor/P100
  - Yellow/Magenta – OV/AG / P100
  - Olive/Black/Magenta – Formaldehyde /Organic Vapor / P100
  - Orange/Magenta – Mercury Vapor / Chlorine / P100

## ***RESPIRATORY PROTECTION***

### ***Qualitative Fit Test (QLFT)***

- (1) The Company performs a Qualitative Fit Test (QLFT) on all personnel required to wear a respirator. This is a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to a test agent. The size respirator issued to the employee will depend on the results of the Qualitative Fit Test.

## ***RESPIRATORY PROTECTION***

### ***Medical Evaluations:***

- (1) The Company will make arrangements with a physician, other licensed health care professional or medical facility to perform medical evaluation.
- (2) Medical questionnaire are obtained from the physician, licensed health care professional or medical facility performing the medical evaluation.
- (3) Follow up medical evaluations shall be conducted at the interval recommended by the medical professional, or Physician. If the Medical Professional or Physician does not make such recommendation, medical evaluations shall be conducted annually.

## ***RESPIRATORY PROTECTION***

- Proper Care and Use of Respirators:
  - (1) Like any piece of equipment, the respirator requires care and upkeep in order to function correctly. Most manufacturers will provide cleaning and storage instructions for their particular product. Follow the manufacturer's guidelines carefully. Be sure to inspect the respirator before and after each use.
  - (2) Air supplied respirators used for IDLH condition must be inspected in the same manner as Air Purifying Respirator. If an Air Supplied Respirator is found unserviceable **DO NOT USE IT**, it must be returned to the Quality Control Office in San Antonio Texas for Repair. Are all clamps, straps, harnesses and valves in good condition? Are any cracks in the face piece or elsewhere? Are the air supply hose and fitting connections in good condition?
  - (3) The Company Issues the 3M600 series respirator to all inspection and maintenance personnel. Manufacturer instructions for Use, Inspection, cleaning, and storage are supplied with all respirators. These instructions are reviewed with the employee when the respirator is issued. The Company does not repair the 3M 6000 series respirator. This respirator must be replaced when damaged.

## ***RESPIRATORY PROTECTION***

- Proper Care and Use of Respirators:
  - (4) Does the filter need to be replaced? Are all clamps, straps, harnesses and valves in good condition? Are any cracks in the face piece or elsewhere? If you find that your respirator is damaged, do not use it. Contact your supervisor for replacement.

## ***RESPIRATORY PROTECTION***

- Donning the Respirator. (3M 6000 Series)
- The procedures listed below are for the 3M 6000 Series half face respirator. Other respirator manufacturer procedures are similar for the same type respirator.
- (1) Place the respirator over your mouth and nose, pull the head harness over the crown of your head.
- (2) Take the bottom straps in both hands and place them in back of your neck to hook them together.
- (3) Position the face piece low on the bridge of your nose for optimal visibility and best fit.
- (4) Adjust top straps first, and then lower neck straps by pulling on the ends of the strap. Strap tension may be decreased by pushing out on the back side of the buckles.

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- Donning the Respirator. (3M 6000 Series)
- (5) Positive Self Test - Place the palm of your hand over the exhalation valve cover and exhale gently. If face piece bulges slightly and no air leaks are detected between your face and face piece, a proper fit has been obtained.
- (6) Negative self Test – Place the heel of you hand over the exhalation valve cover and inhale gently. If the face piece collapses around you face and no air leaks are detected between you face and face piece, a proper fit has been obtained.

## ***RESPIRATORY PROTECTION***

- Inspecting the Respirator (3M 6000 Series)
- (1) The procedures listed below are for the 3M 6000 Series half face respirator. Other respirator manufacturer procedures are similar for the same type respirator.
- (2) The face piece must be inspected before each use to ensure that it is in good operating condition. The face piece should be disposed of upon observation of damage or defective parts.
- (3) Check the face piece for cracks, tears and dirt. Be certain the face piece face seal area, is not distorted.
- (4) Examine the inhalation valves for signs of distortion, cracking or tearing. Make sure the head straps are intact and have good elasticity.

## ***RESPIRATORY PROTECTION***

- Inspecting the Respirator (3M 6000 Series)
- (5) Examine all plastic parts for signs of cracking or fatiguing. Make sure filter gaskets are properly seated and in good condition.
- (6) Remove exhalation valve cover and examine the exhalation valve and valve seat for signs of dirt, distortion, cracking or tearing. Replace the exhalation valve cover.

## ***RESPIRATORY PROTECTION***

- Cleaning and Storage of the Respirator
- (1) Cleaning with solvents may degrade some respirator components and reduce respirator effectiveness.
- (2) Remove all cartridges and/or filters. Clean the face piece (excluding filters and cartridges) with respirator wipes or by immersing the respirator in warm cleaning solution, water temperature is not to exceed 120 deg F, and scrub the respirator with a soft brush until clean. Add a neutral detergent if necessary. Do not use cleaners containing lanolin or other oils.

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- Cleaning and Storage of the Respirator
- (3) Disinfect the face piece by soaking it in a solution ammonia disinfectant or sodium hydrochloride or other disinfectant.
- (4) Rinse the face piece in warm water and air dry in a non-contaminated atmosphere.
- (5) The cleaned respirator should be stored in a container or bag away from contaminated areas when not in use.

## ***RESPIRATORY PROTECTION***

- Requirements for Touch-Up Painting:
  - (1) Respirators required in this area shall be, at a minimum, a half-face negative pressure type with organic vapor cartridges. A respirator offering greater protection may be substituted for the half-face type respirator. The cartridges of any negative pressure type respirator used to paint must be changed after each use.
- Additional Procedures for Painting
  - (1) Any type of spray painting by any employee will require the use of respiratory protection for the employee actually doing the spraying and for all employees in the immediate area of the painting.

## ***RESPIRATORY PROTECTION***

- Formic Acid Strippers
  - (1) A full-face supplied air respirator is required for every person working in a hangar where an aircraft is being stripped with a formic acid-based paint stripper.
  - (2) Additional PPE required includes appropriate gloves and protective clothing.
- Benzyl Alcohol Strippers
  - (1) No respirator is required to use a benzyl alcohol-based paint stripper.
  - (2) Additional PPE required includes appropriate gloves and protective clothing.



## ***RESPIRATORY PROTECTION***

- Other Stripper Types
  - (1) Other types of paint strippers shall be evaluated and respirator and PPE requirements documented for the facility where they are used, before putting them into use.
- Spray Solvents / Adhesives
  - (1) Whenever using a spray solvent or adhesive, a half-face negative pressure respirator with organic vapor filters shall be used
  - (2) Appropriate gloves and safety goggles / glasses are required when using spray solvents or adhesives.

## ***RESPIRATORY PROTECTION***

- Grinding, Sanding, Sand / Bead Blasting
  - (1) A NIOSH-approved particulate filtering respirator is required whenever grinding, sanding, or sand / bead blasting.
- Fuel Tank Entry (IDLH) Condition
  - (1) Whenever acceptable atmospheric entry conditions can not be met in accordance with The Company Confined Space procedures a full face air supplied respirator shall be used.