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***Section I***  
***Purpose Of The Plan***

## Policy

In the ongoing control of occupational diseases and deaths caused by inhaling air that is deficient in oxygen and/or contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective of Hilscher-Clarke is to first prevent atmospheric contamination and deficiencies. Whenever feasible, control of atmospheric contamination and deficiencies shall be accomplished by implementing accepted engineering and/or administrative controls, including:

- Enclosure
- Isolation
- Local Exhaust Systems
- General Exhaust Systems
- Material Substitutions

It is the policy of Hilscher-Clarke to utilize respiratory protection only when effective engineering and/or administrative controls are not feasible, or while controls are being implemented. A sound and effective respiratory protection program is an essential aspect in assuring that personnel using such equipment are adequately protected.

This safety policy and procedure presents guidelines for the use of respiratory protection to protect Hilscher-Clarke, employees from airborne hazards. It includes provisions for training and discussion on the requirements for a written respirator program. The scope of this plan includes, but is not limited to:

- Administration Requirements of a Respiratory Protection Program;
- The need for hazard assessments;
- Respirator selection guidelines;
- Recordkeeping requirements;
- Purchasing;
- Medical Requirements associated with respiratory protection;
- Areas of responsibility.

This safety policy and procedure affects any employee who, as a result of his or her job duties, is exposed to air contaminants or hazardous environments where contaminants exceed the Permissible Exposure Limit (PEL) or are immediately dangerous to life and health and personnel trained and authorized in emergency response.

This safety policy and procedure is established in accordance with Occupational Safety and Health Standards for General Industry (29 CFR 1910.134 and Occupational Safety and Health Standards for Construction Industry (29 CFR 1926.103).

The scope and objectives of Hilscher-Clarke's Respiratory Protection policy and procedures include:

- To ensure that respiratory protective equipment is utilized only when effective administrative and/or engineering controls are not feasible; or while they are being implemented.
- To ensure that the correct type of respiratory protective equipment (i.e., right type of cartridges for the particular contaminant) is selected for each application.

## Policy (cont.)

- To ensure that only respirators, cartridges, and replacement parts that have been approved by;
  - *National Institute of Occupational Safety & Health (NIOSH)*, or;shall be used by Hilscher-Clarke employees.
- To ensure that respiratory protective equipment is clean and in good working order.
- To ensure that respiratory protective equipment properly fits the user.
- To ensure that users of respiratory protective equipment are adequately trained in the care, limitations, and proper application of the device.
- To ensure that regulatory documentation is established and maintained in a logical accessible manner.

It is the responsibility of the Safety Manager, Supervisors and each Employee to ensure implementation of Hilscher-Clarke's safety policy and procedure on Respiratory Equipment. It is also the responsibility of each Hilscher-Clarke employee to report immediately any unsafe act or condition to the Safety Manager and/or Supervisor. Specific Responsibilities are found in Section II (General Program Management).

***Section II***  
***General Program***  
***Management***

## Program Administration

- ❑ **The Vice President** is responsible for the development, implementation, and overall administration of the Respirator Protection Program. These responsibilities include, but are not limited to **Acting as Hilscher-Clarke's Respiratory Protection Program Administrator. In his absence the Safety Manager shall oversee these duties.**
- ❑ Reviewing, maintaining, and updating the respiratory protection written program annually and whenever necessary to include new or modified tasks, procedures, equipment, training and/or recordkeeping.
- ❑ Establishment of a periodic inspection schedule of those worksites/conditions that require respiratory equipment in order to determine exposure and/or changing situations.
- ❑ Ensuring compliance through the auditing process as outlined in Hilscher-Clarke's Disciplinary Program.
- ❑ Establish procedure for maintaining, and ensuring, the ongoing confidentiality of all employee records associated with Hilscher-Clarke's Respiratory Protection Program.
- ❑ The Vice President may delegate the responsibility of various aspects of the Respiratory Protection Program to a Qualified Organization. However, the Vice President's ultimate responsibility for his/her aspects of the program cannot be delegated.

**Safety Manager** is responsible for:

- ❑ Hazard Assessment – Determining level of protection necessary to accomplish a specific task (i.e., 29 CFR 1926.103, Table E-4).
- ❑ Ensuring that only NIOSH approved respiratory protection equipment and related supplies are purchased.
- ❑ Employee Training - Obtaining and coordinating respiratory equipment training programs for the Affected Employees.
- ❑ Establishment of medical screening program/procedures for employees assigned to wear respiratory protection equipment.
- ❑ Providing instruction to personnel on the proper use, maintenance, storage and disposal of respiratory protection equipment.
- ❑ Identifying the employees affected by this safety policy and procedure and ensuring that those employees are provided a medical examination before being issued a respirator.
- ❑ Providing a fit testing program for respirator wearers.
- ❑ Designation of proper storage areas for respiratory protection equipment.
- ❑ With the approval of the Vice President the Safety Manager may delegate the responsibility of various aspects of the respiratory protection program to another Competent Person, or Qualified Organization (as approved by the Vice President). However, the Safety Manager's ultimate responsibility for his/her aspects of the program cannot be delegated.

**Supervisory Personnel** are responsible for:

- ❑ Implementation and enforcement of the respiratory protection program at their work site.
- ❑ Supervisors will not allow any employee who has not received the required training, or medical evaluation, to perform any of the tasks or activities requiring respiratory protection. They will also ensure that respirators are properly worn and maintained.
- ❑ Ensuring that an adequate supply of NIOSH approved respirators, cartridges, and replacement parts are available.
- ❑ Identifying and notifying the Safety Manager of tasks/procedures that may require exposure/health assessments to determine if individuals need to utilize respiratory protection.

## Program Administration (cont.)

### Supervisory Personnel (cont.)

- With the approval of the Safety Manager the Supervisor may delegate the responsibility of various aspects of the respiratory protection program to another Qualified Person, Competent Person or Qualified Organization (as approved by the Vice President). However, the Supervisor's ultimate responsibility for his/her aspects of the program cannot be delegated.

### Employees

- Shall comply with all applicable guidelines contained in this safety policy and procedure.
- Use respirators in accordance with instructions and guidelines received during training courses.
- Store, clean, maintain and protect respirators from damage, and maintain any appropriate records.
- Report any problems or malfunction with respiratory protective equipment to the Supervisor or Safety Manager immediately.
- Inform the contracted medical personnel of health changes that would affect the safe use of a respirator.
- Are clean shaven at the points of seal.
- Employees are required to read all literature pertaining to the use and maintenance of each protective device before being allowed to wear the same for work purposes.
- Employees will be available, with the protective devices, for inspection and fit testing as requested by the Supervisor and/or Safety Manager or Qualified Organization.

### Qualified Person/Competent Person/Qualified Organization

A "Qualified Organization" may act in the following capacity(ies). The Vice President or Safety Manager will designate the "Qualified Organization".

- Conducting air monitoring where there is a suspicion of air contamination; and
- Identifying, through exposure assessments and workplace evaluations:
  - The substance(s) present in the work environment for which respiratory protection is needed.
  - The physical state of the contaminant(s) (i.e., gas, vapor, dust, mist, etc.)
  - The Permissible Exposure Limit (PEL) and toxicity of the substance.
  - The concentrations of the air contaminants likely to be encountered.
  - The fit factor listed for the respirator type.
  - The possibility of skin absorption or eye irritation.
  - The possibility of oxygen deficiency.
  - The nature of the individual's task/procedure.

And recommend exposure controls.

### Other (i.e., Qualified Organization, Medical Personnel, etc.)

- Health, safety, medical, industrial hygiene consultants shall be utilized to support the Respiratory Protection Program as needed. Consultants may be utilized to provide consultative and audit assistance to ensure effective implementation of this safety policy and procedure.
- Medical and health personnel will be utilized to:
  - Aid Hilscher-Clarke in the development and implementation of a medical surveillance program for all personnel utilizing respiratory protection.

## Program Administration (cont.)

### **Other (i.e., Qualified Organization, Medical Personnel, etc.)**

- Perform initial evaluations and physical examinations of the individuals using respiratory protection to determine if the individual is medically able to wear respiratory protective equipment.
- Conducting periodic evaluations (and physicals as necessary) of respirator users.
- Provide training, expertise and guidance to the Qualified Person on air monitoring, exposure control, and risk assessment strategies.
- Ensuring that all newly purchased respirators and supplies comply with current safety regulations and the requirements of this safety policy and procedures.

### **Human Resources is responsible for:**

- Retention, confidentiality, and if applicable, distribution, of all **medical records** for the specific time periods outlined in this plan.
- The Human Resources of Hilscher-Clarke will prepare and maintain an Employee Education and Training Record (*see Appendix A*) upon completion of training and any retraining. These documents will include, but not be limited to;
  - Names or other identities of employees trained;
  - Signature of the person receiving the training;
  - Date of the training;
  - Date of retraining;
  - Specific topics addressed during the training session;
  - Specific topic(s) addressed during the retraining session;
  - Signature of the person, or company, conducting the training;
  - Signature of the person, or company, conducting the retraining.
- Making the written Respiratory Protection Plan available to employees, OSHA & NIOSH representatives.
- The original training documents will be kept with the employee's records at our main office and a copy of this training record will be kept in the "Safety File" at the work site, as appropriate.

# ***Section III***

## ***Definitions***

## General Plan Definitions

**Administrative/Work Practice Controls** – Control methods that don't eliminate respiratory hazards but minimize exposure levels so that workers aren't harmed.

**Aerosol** – Particles, solid or liquid, suspended in air.

**Approved** - Evaluated and listed as permissible by NIOSH, for the respirator's intended use.

**Cartridge/Canister** – A respirator component containing a filter, sorbent, or catalyst that removes specific air contaminants.

**Contaminant** – A harmful, irritating, or nuisance airborne material.

**Disposable Respirator** – A respirator for which maintenance is not intended and that is designed to be discarded after excessive resistance, sorbent exhaustion, physical damage, or end-of-use-service-life renders it unsuitable for its intended use.

**Dust** – An aerosol consisting of mechanically produced solid particles derived from the breaking up of larger particles.

**Exposure Limit** – The maximum allowable concentration of a contaminant in the air to which an individual may be exposed. These may be time-weighted averages, excursion limits, ceiling limits and short-term limits.

**Filter** – A component used in respirators to remove solid or liquid aerosols from the air.

**Fit Check** – A test conducted by the wearer to determine if the respirator is properly sealed to the face.

**Fit Factor** – A quantitative measure of how well a respirator protects the wearer. It's the ratio of the concentration of a contaminant in the environment to the concentration inside the mask.

**Fit Test** – The use of challenge agent to evaluate the fit of a respirator on an individual.

**Fume** – Solid aerosols formed by the condensation of gas or vapor.

**Hazardous Atmosphere** – An atmosphere that contains a contaminant(s) in excess of the exposure limit or is oxygen deficient.

**High-Efficiency Filter** – A filter that removes from the air 99.97 percent or more of the aerosols having a diameter of 0.3 micrometers.

**Immediately Dangerous to Life or Health (IDLH)** – Any atmosphere that poses an immediate threat to a worker's life, would cause irreversible adverse health effects, or would impair the worker's ability to escape.

**Licensed Health Care Professional (LHCP)** – A person licensed to provide respirator medical evaluations or examinations. Any health professional that qualifies as a LHCP can perform a medical evaluation/examination. "Qualifies" means that the medical examination or evaluation procedures are permitted by the LHCP's state medical licensing board.

**N-Series** – The designation for a respirator filter that protects against solid and water-base particulates such as nuisance dust. N-series filters are available in three levels of efficiency: N95, N99 and N100; the higher the number, the less filter breakthrough.

**NIOSH** – National Institute of Safety and Health

**P Series** – The designation for a respirator filter that protects against any particulates, including oil-based materials, with no specific time limit. These filters are available in three levels of efficiency: P95, P99, P100; the higher the number, the less filter breakthrough.

**Permissible Exposure Limit (PEL)** – Regulatory limits for contaminants that include, but are not limited to:

- Eight hour Time Weighted Average (TWA);
- Short Term Exposure Limit (STEL);
- Ceiling (c);
- Excursion Limits.

**Personal Protective Equipment (PPE)** – Protective clothing or equipment worn by a worker; includes respirators and all other types of respiratory devices.

**Qualified Person** – Individual who has training and experience in air monitoring, exposure assessment,

**Respiratory Hazard** - Any harmful substance in the air you breath.

**R-Series** – The designation for a respirator filter that protects against any particulates, including oil-based materials. Wearers of R-series filters are generally limited to one eight-hour shift if oil aerosols are present. These filters are available in three levels of efficiency: R95, R99, and R100; the higher the number, the less filter breakthrough.

**User Seal Check** – A set of procedures performed by the respirator user to determine if the respirator has an effective face-to-facepiece seal.

and workplace evaluations under the direction of a Competent Person.

**SAR** – Supplied air respirator. An atmosphere-supplying respirator in which the breathing air is not carried on the person.

**SCBA** – Self-Contained Breathing Apparatus. A class of respirator that supplies a respirable atmosphere independent of the existing atmosphere.

**Tight Fitting Facepiece** – An inlet covering that forms a complete seal with the wearer’s face.

**Workplace Exposure Evaluation** – Air monitoring for contaminants in the workplace that is performed by a qualified person

## Material Safety Data Sheet (MSDS) Definitions

The primary method of determining whether respiratory hazards exist is through Hilscher-Clarke Construction's Co., Hazard Communication Program (HAZCOM). The following are definitions for the most common MSDS terms that apply to respiratory issues. For further information of MSDS's refer to Hilscher-Clarke's Hazard Communication Program and Policy.

**Asphyxiant** – A vapor or gas that can cause unconsciousness or death by suffocation (lack of oxygen). Most simple asphyxiants are harmful to the body only when they become so concentrated that they reduce oxygen in the air (normally about 21%) to dangerous levels (18% or lower). Asphyxiation is one of the principal potential hazards of working in confined or enclosed spaces.

**Ceiling Limit (PEL or TLV)** – The maximum allowable human exposure limit for an airborne substance that is not to be exceeded even momentarily.

**Confined Space** – Any area that has limited openings for entry or exit that would make escape difficult in an emergency, has a lack of ventilation, contains known and potential hazards, and is not intended nor designated for continuous human occupancy.

**Dust** – Solid particles generated by handling, crushing or grinding.

**F/cc** – Fibers per cubic centimeter, a measurement used to assess the number of air-borne fibers or substances such as asbestos.

**Fume** – A solid condensation particle of extremely small diameter, commonly generated from molten metal as metal fume.

**Inhalation** – Breathing in of a substance in the form of a gas, vapor, fume, mist or dust.

**LHCP** – Acronym for licensed health care professional.

**Local Exhaust** – A system for capturing and exhausting contaminants from the air at the point where contaminants are produced (welding, grinding, sanding, etc.)

**Mg/m<sup>3</sup>** – Milligrams per cubic meter is a unit for expressing concentrations of dusts, gases, or mists in air.

**Mist** – Suspended liquid droplets generated by condensation from the gaseous to the liquid state, or by breaking up a liquid into dispersion, such as splashing, foaming, or atomizing. Mist is formed when a finely divided liquid is suspended in air.

**mppcf** – Million particles per cubic foot is a unit for expressing concentration of particles of a substance suspended in air. Exposure limits for mineral dusts (silica, graphite, Portland cement, nuisance dusts, and others) formerly expressed as mppcf, are now more commonly expressed as mg/m<sup>3</sup>.

**Odor Threshold** – The lowest concentration of a substance's vapor that can be smelled by most people.

**Pneumoconiosis** – A condition of the lung in which there is permanent deposition of particulate matter and the tissue reaction to its presence. It may range from relatively harmless forms of iron oxide deposition to destructive forms of silicosis.

**ppb and ppm** – Parts per billion and parts per million. Expresses volume concentration by parts of gas or vapor in a billion or million parts of air.

**Pulmonary Edema** - Fluid in the lungs.

**REL** – The NIOSH Recommended Exposure Limit is the highest allowable airborne concentration which is not expected to injure most healthy adult workers. It may be expressed as a ceiling limit or as a time-weighted average.

**Respiratory System** – The breathing system that includes the lungs and the air passages (trachea or "windpipe", larynx, mouth and nose) to the air outside the body, plus the associated nervous and circulatory supply.

**Routes of Entry** – the means by which material may gain access to the body of which there are four: inhalation, ingestion, skin contact, and injection.

**Silicosis** – A disease of the lungs (fibrosis) caused by the inhalation of silica dust.

**Smoke** – A dense mixture of many gases, vapors, fumes, and carbon particles resulting from incomplete combustion.

**Target Organ Effects, Target Organ Toxins** – Substance may have an effect or be a toxic with respect to a particular organ group. For example, the predominant target organ for asbestos and silica is the lung.

**TCL** – Toxic Concentration Low; lowest concentration of a gas or vapor capable of producing a defined toxic effect in a specified test species over a specified time.

**TLV** – Threshold Limit Value is a term used by an ACGIH to express the airborne concentration of material to which nearly all healthy adult workers

can be exposed day after day without adverse effects. ACGIH expresses TLV three ways:

- TLV-TWA: The allowable time-Weighted Average concentration for a normal 8-hour workday or 80-hour workweek.
- TLV-STEL: The Short-Term Exposure Limit, or maximum concentration for a continuous 15-minute exposure period (maximum of four such periods per day, with at least 60 minutes between exposure periods, and provided the daily TLV-TWA is not exceeded).
- TLV-C: The Ceiling Exposure Limit – The concentration that should not be exceeded even instantaneously.

**TWA** – Time-Weighted Average exposure is the airborne concentration of a material to which a person is exposed, averaged over the total exposure time – generally the total workday (8 to 12 hours).

**Vapor** – The gaseous form of a solid or liquid substance as it evaporates.

***Section IV***  
***Written Respiratory***  
***Program***

## 1.0 General Requirements

- 1.1 It is mandatory that employees wear the appropriate respiratory protection equipment when working where the air contains regulated substances in concentrations exceeding the permissible exposure limit (PEL), and whenever there is potential exposure to a contaminant substance for which the contaminant's material safety data sheet (MSDS) prescribes respirator use.
- 1.2 The Safety Manager will maintain surveillance of work conditions in all places where employees of Hilscher-Clarke work, as well as employee exposures and stress, in order to determine if any additions too, or changes in, respirator use requirements are needed.
- 1.3 The Safety Manager shall promptly notify employees of changes whenever they are needed.
- 1.4 This respiratory protection program, the instructions accompanying the respirator, the applicable OSHA regulations and the precautions stated in the MSDS for each of the substances being protected against must be observed by each user of a respirator.
- 1.5 No employee shall perform a job that requires respirator use, or be present at any place where respirators are necessary, unless all provisions of this Respirator Program are observed.
- 1.6 Any employee performing such a job, or present in such a place, who is wearing a respirator must immediately cease their work, leave the area and report the matter to their Supervisor whenever any of the following conditions exists:
  - Dizziness, difficulty breathing or other physical or stress disorder;
  - Damage to, or ineffectiveness of, the respirator being worn;
  - The smell or taste of any contaminant or any unfamiliar smell or taste of other such sensation that troubles or concerns the employee; or
  - Lack of the respirator training and instruction required under this Program or the absence of any other requirement of this program.
- 1.7 Surveillance of conditions in the work area and degree of worker exposure of stress (combination of work rate, environmental conditions and physiological burdens of respirator) must be maintained at all times.
- 1.8 Changes in operating procedures, temperature, movement of air, humidity and work practices may influence the concentration of a substance in the work area atmosphere. These factors may necessitate periodic monitoring of the air contaminant concentration. If testing is undertaken, it should continue in order to assure that the contaminant has not risen above the maximum capability of the respirators being used.
- 1.9 **Employees using self-contained breathing apparatus or supplied-air respirators in confined spaces, where the air may be "Immediately Dangerous To Life and Health," must wear safety harnesses and lifelines.** A second person equipped with complete protective gear must be standing by ready to help if the first worker gets into trouble. Communications (i.e., voice, visual, or signal line) must be maintained with all persons present. Precautions must be taken so that in the event of an incident, at least one person will be unaffected and have the proper rescue equipment to be able to assist those encountering an emergency situation.
- 1.10 Only those individuals who are medically able to wear respiratory protective equipment shall be issued this type of equipment. No employee shall wear a respirator unless they are medically able to do so.
- 1.11 No one shall be permitted to use a respirator unless they are physically capable of performing their work while wearing the respiratory protection device. This shall be determined by a LHCP.

## 1.0 General Requirements (cont.)

- 1.12** Prior to respiratory protection equipment being used by any employee, the employee must complete a medical questionnaire, be examined by a LHCP, and be certified as fit to wear the requested respiratory protection equipment.
- 1.13** The fitness requirement will be at the discretion of the examining LHCP, but if any respirator user's physical ability changes at any time, they must notify their Supervisor at once and cease respirator use until medical approval for resuming respirator use has been obtained.
- 1.14** The examining physician will determine what health and physical conditions are pertinent to an employee's respirator usage.
- 1.15** Each respirator user must receive fitting instructions that include demonstrations and practice on how the respirator should be worn, how to adjust and how to determine if the respirator fits properly.
- 1.16** Although respirators are designed for maximum efficiency, they cannot protect the wearer without a tight seal between the facepiece and wearer. Beards and other facial hair can substantially reduce the effectiveness of a respirator. The absence of dentures can seriously affect the fit of a facepiece. To assure proper protection for a facepiece, it must be checked by the wearer each time the respirator is put on.
- 1.17** Corrective lenses worn by employees also present a problem when fitting respirators. Special mountings to hold corrective lenses inside full facepieces are available. If corrective lenses are needed, the facepiece and lens must be fitted by a qualified individual to provide good vision, comfort, and proper sealing.
- 1.18** Contact lenses should not be worn while wearing a respirator in a contaminated area. Foreign bodies or contaminants that penetrate the respirator may get into the eyes and cause severe discomfort compelling the wearer to remove the respirator.
- 1.19** Full facepiece and half-mask respirators have different fitting characteristics. No one respirator will fit everyone.
- 1.20** Any employee who finds that they cannot obtain a proper fit with their respirator must notify their Supervisor or the Safety Manager immediately.
- 1.21** Upon notification by any worker of any respirator's improper fit, the Supervisor shall not permit the employee to work in any area where respiratory protection is required until the employee is equipped with a proper-fitting respirator.
- 1.22** The effectiveness of the facepiece fit of a respirator can be tested either by qualitative or quantitative measures:
  - 1.22.1** Qualitative fit testing involves the introduction of a harmless, odorous or irritating substance into the breathing zone of the wearer. A proper fit is indicated if the wearer cannot detect the irritating substance.
  - 1.22.2** Quantative fit testing offers more detailed information on respirator fit. It involves the introduction of an aerosol to the wearer while they are in a test chamber. While the wearer performs exercises that could induce facepiece leakage, the air inside the facepiece is measured for the presence of the aerosol.
- 1.23** The Supervisor of each respirator wearer is responsible for ensuring that the appropriate facepiece fit test has been conducted and that the result of such testing has indicated a proper fit. Table 1 (*on the following page*) offers acceptable guidelines for choosing the proper fit-testing method.

## 1.0 General Requirements (cont.)

**Table 1**

Type of Respirator/Faceplate	Qualitative Fit Test	Quantitative Fit Test
Half-face negative-pressure air-purifying respirator (<100 fit factor)	Yes	Yes
Full-face negative-pressure air-purifying respirator (<100 fit factor)	Yes	Yes
Full-face negative-pressure air-purifying respirator (<100 fit factor)	No	Yes
Powered air-purifying respirators (PAPRs)	Yes	Yes
Supplied-air respirators (SARs) or self-contained breathing apparatus (SCBA) used in the negative-pressure mode	No	Yes
Supplied-air respirators (SARs) or self-contained breathing apparatus (SCBA) used in the positive-pressure mode	Yes	Yes
SCBAs and SARs for atmospheres immediately dangerous to life and health (IDLH), positive pressure	Yes	Yes
Loose-fitting respirators (i.e., hoods and helmets)	Fit-testing not required	
<p><b>Guidelines to fit-test atmosphere-supplying or powered air-purifying respirators in a negative-pressure mode. Please note that you must remove any modifications made to a respirator facepiece for fit-testing and restore it to its original NIOSH-approved configuration before anyone can use it on a Hilscher-Clarke controlled work site.</b></p>		
<p><b>Qualitative Fit-Test</b></p> <p>The respirator must be temporarily converted to a negative-pressure respirator with appropriate filters following the manufacturer's instructions. You may also substitute an identical negative-pressure air-purifying respirator with the same sealing surfaces for the atmosphere-supplying or powered air-purifying respirator.</p>	<p><b>Quantitative Fit-Test</b></p> <p>In addition to the qualitative fit-test procedures, you must modify the respirator facepiece so that you can sample inside it, midway between the wearer's nose and mouth. To accomplish this, you can either install a permanent sampling probe in a surrogate facepiece or use a sampling adapter supplied by the manufacturer.</p>	

**1.24** Workers who fail a fit test must select another facepiece and be retested.

**1.25** Any individual may request the use of a respirator because of a nuisance exposure or for personal reasons. These circumstances should be evaluated and respirator use approved, by the Safety Manager, if the circumstances favor the use of a respirator.

## 2.0 Respirator Selection

- 2.1** The company shall provide (at no cost to the individual) appropriate NIOSH approved respiratory protective devices and the employees/individuals shall use these devices whenever necessary to protect their health due to the nature of the work environment.
- 2.1.1** Proper selection of respirators must be made according to the OSHA requirements set forth in 29 CFR 1910.134 (c) and the American National Standards Institute (ANSI) publication “Practices for Respiratory Protection,” ANSI Z88.2-1990. Only National Institute of Occupational Safety and Health (NIOSH) approved type respirators shall be purchased and used by Hilscher-Clarke to protect employees/individuals from airborne contaminants.
- 2.1.2** In addition to the aforementioned, there are substance-specific OSHA standards that require additional criteria for respirator selection (i.e., 29 CFR 1910.1101 (d)(2)(IV) Asbestos). All such requirements of each applicable OSHA standard must be observed.
- 2.2** Choosing the correct respiratory protection equipment involves several steps:
- Determination of the hazard;
  - Choosing equipment that is certified for the function;
  - Assuring the device is performing the function it is intended to do.
- 2.3** The nature and extent of the hazard, the work rate, the area to be covered (including emergency escape time), mobility, work requirements and conditions, as well as the limitations and characteristics of the available respirators, also are selection factors that must be considered:

Type of Exposure	Selection Procedure
<p style="text-align: center;"><b>Particulate Exposure</b></p>	<p>Respirators will be selected on the basis of:</p> <ul style="list-style-type: none"> <li>▪ Potential oil-mist exposure (N,R or P);</li> <li>▪ Severity of the inhalation hazard (95%, 99% or 100% efficient)</li> <li>▪ Air-particulate concentration</li> <li>▪ Availability of 21% oxygen</li> </ul>
<p style="text-align: center;"><b>Vapor &amp; Gas Exposure</b></p>	<p>Respirators will be selected on the basis of:</p> <ul style="list-style-type: none"> <li>▪ Chemical composition</li> <li>▪ Physical state (vapor or gas)</li> <li>▪ Air-contaminant concentration</li> <li>▪ Availability of 21% oxygen</li> </ul>
<p style="text-align: center;"><b>Atmospheric oxygen at or below 19.5% or air contaminants immediately dangerous to life and health</b></p>	<p>Supplied-Air respirators will be selected:</p> <ul style="list-style-type: none"> <li>▪ Only Grade D breathing air will be used for supplied-air respirators</li> <li>▪ Only oilless breathing-air-compressor or oil-compressor systems provided with carbon monoxide (10 ppm) or high temperature alarms periodically tested for the presence of carbon monoxide will be used.</li> </ul>
<p style="text-align: center;"><b>Escape Only Respirators</b></p>	<p>Respirators will be selected based on the potential for a specific type of hazardous gas leak, relevant engineering controls, and the time required for workers to escape to a safe place.</p> <ul style="list-style-type: none"> <li>▪ Only NIOSH-approved escape respirators will be used.</li> </ul>

## 2.0 Respirator Selection

Although many kinds of breathing equipment are used for protection, the respirators utilized by Hilscher-Clarke fall into one of the following three categories based on how they operate:

- 2.4 Air-Purifying Respirators** have an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through an air-purifying element. Air purifying respirators are available in nonpowered and powered types:
- The wearer operates the nonpowered types just by breathing.
  - A powered air-purifying respirator is equipped with a blower that passes ambient air through one or more air-purifying elements.
  - Table 2 illustrates the subtypes of air-purifying respirators.

**Table 2**

Air Purifying Respirators (APRs)	
<b>Nonpowered</b>	<ul style="list-style-type: none"> <li>▪ Particle-removing</li> <li>▪ Gas-vapor-removing</li> <li>▪ Combination particle-gas-vapor-removing</li> </ul>
<b>Powered (PAPR)</b>	<ul style="list-style-type: none"> <li>▪ Particle-removing</li> <li>▪ Gas-vapor-removing</li> <li>▪ Combination particle-gas-vapor-removing</li> </ul>

- *Air-purifying respirators may not be used in an oxygen-deficient atmosphere or under conditions immediately dangerous to life and health.*

**2.5 Atmosphere-Supplying Respirators** supplies the user with breathable air from a source other than the ambient atmosphere. There are three basic types of atmosphere-supplying respirators:

- Supplied Air (SAR) – Uses breathable air from a stationary source, such as a compressor, isolated from the wearer. Breathable air is supplied to the respiratory-inlet covering of the respirator through a flexible hose.
- Self Contained Breathing Apparatus (SCBA) isn't connected to a stationary source of breathable air. Instead, the wearer carries the air supply.
- Supplied Air with Auxiliary SCBA is generally used for emergency escape from a hazardous atmosphere.
- Table 3 illustrates the subtypes of Atmosphere Supplying Respirators.

**Table 3**

Atmosphere Supplying Respirators	
<b>Supplied Air (SAR)</b>	<ul style="list-style-type: none"> <li>▪ Airline Continuous Flow Demand Pressure Demand</li> </ul>
<b>Self-Contained (SCBA)</b>	<ul style="list-style-type: none"> <li>▪ <i>Open-Circuit</i> Continuous-flow Demand Pressure-Demand</li> <li>▪ <i>Closed-Circuit</i> Rebreather with cylinder of oxygen Recirculator with oxygen self-generator</li> </ul>

- All atmosphere-supplying respirators protect wearers from toxic particulates, gases, vapors, and oxygen-deficient atmospheres.

## 2.0 Respirator Selection (cont.)

**2.6** *Combination Atmosphere-Supplying & Air-Purifying respirators* will protect a worker who must pass through a hazardous area and who isn't connected to a source of compressed air. The worker uses the air purifier when entering and leaving the hazardous area, then connects to the airline part of the combination respirator at a work area.

- The time needed to perform a given task usually determines the length of time for which respiratory protection is needed, including the time necessary to enter and/or leave a contaminated area.
- Unless a specific OSHA standard exists containing different requirements, respirators shall be selected according to the above instructions and Table 4 and Table 5.

Respirator Selection choices for environments *not* immediately dangerous to life and health (Not IDLH):

**Table 4**

Type of Protection	Atmosphere-Supplying Respirator	Air Purifying Respirator
Protection against gases and vapors	Yes	Yes, if the respirator has an end-of-service-life indicator (ESLI) or the employer has an effective change schedule for canisters and cartridges
Protection against particulates	Yes	Yes, if equipped with any of the following: <ul style="list-style-type: none"> <li>▪ A high-efficiency particulate air (HEPA) filter certified by NIOSH.</li> <li>▪ A filter certified for particulates by NIOSH under 42 CFR part 84.</li> <li>▪ A filter certified by NIOSH under 30 CFR 11 for protection against particulates.</li> </ul>

## 2.0 Respirator Selection (cont.)

**Table 5**

Type of Respirator	Advantages	Disadvantages
<b>Nonpowered Air-Purifying</b>	<ul style="list-style-type: none"> <li>▪ Small &amp; Compact</li> <li>▪ Lightweight</li> <li>▪ Low initial cost</li> </ul>	<ul style="list-style-type: none"> <li>▪ Can't be used in oxygen-deficient/immediate dangerous to life and health (IDLH) environments</li> <li>▪ Negative pressure inside facepiece may result in leakage with improper fit</li> <li>▪ Selection of proper type critical</li> <li>▪ Fit-test required</li> <li>▪ Generally high replacement and maintenance costs</li> </ul>
<b>Powered Air-Purifying</b>	<ul style="list-style-type: none"> <li>▪ No mobility restrictions</li> <li>▪ Minimal breathing resistance and discomfort</li> <li>▪ Fit testing not required with loose-fitting inlet coverings</li> </ul>	<ul style="list-style-type: none"> <li>▪ Can't be used in oxygen-deficient/IDLH environments</li> <li>▪ Selection of proper type critical</li> <li>▪ Fit-test required for tight-fitting facepieces</li> <li>▪ Loss of protection with blower failure</li> <li>▪ High initial and maintenance costs</li> </ul>
<b>Airline Supplied-Air</b>	<ul style="list-style-type: none"> <li>▪ Useable for long periods</li> <li>▪ Minimal breathing resistance and discomfort</li> <li>▪ Low weight and bulk</li> <li>▪ Fit-testing not required with loose-fitting inlet coverings</li> <li>▪ High level of protection with some devices</li> <li>▪ Useable in some oxygen-deficient atmospheres</li> <li>▪ Moderate initial and maintenance costs</li> </ul>	<ul style="list-style-type: none"> <li>▪ Can't be used in IDLH environments</li> <li>▪ Trailing air-supply hose restricts mobility and can be damaged</li> <li>▪ Loss of protection with air-supply failure</li> <li>▪ Air quality must specific standards</li> <li>▪ Fit-testing required with tight-fitting facepieces</li> </ul>
<b>Hose-Mask Supplied Air</b>	<ul style="list-style-type: none"> <li>▪ Useable for long periods</li> <li>▪ Minimal breathing resistance with some types</li> <li>▪ Useable in some oxygen-deficient atmospheres</li> <li>▪ Simple construction/low bulk</li> <li>▪ Easy maintenance/low cost</li> </ul>	<ul style="list-style-type: none"> <li>▪ Can't be used in IDLH environments</li> <li>▪ Fit-test required</li> <li>▪ Air-supply hose can be damaged</li> <li>▪ Loss of protection with air-supply failure</li> </ul>
<b>Self-Contained Breathing Apparatus</b>	<ul style="list-style-type: none"> <li>▪ Maximum mobility with minimum restriction</li> <li>▪ Maximum level of protection</li> </ul>	<ul style="list-style-type: none"> <li>▪ Complex</li> <li>▪ Heavy and bulky</li> <li>▪ Not suitable for long periods</li> <li>▪ Fit-testing required for tight-fitting facepieces</li> <li>▪ Extensive training required</li> <li>▪ High initial and maintenance costs</li> <li>▪ Air quality must meet specific standards</li> </ul>

### 3.0 Employee Training, Instruction & Discipline

Selecting the respirator appropriate to a given hazard is important, but equally important is using the selected device properly. Proper use can be ensured by carefully training both management and employees in selection, use, fit testing and maintenance of respirators. Unless the reasons for the use of respiratory protective devices and instruction on proper use and maintenance are thoroughly understood and ongoing training provided, the devices will not be used or may not work properly. Because of this, Hilscher-Clarke, has set forth the following guidelines for employee training, instruction and discipline, for non-compliance.

- 3.1** Every employee who is required to wear a respirator must know how to wear it, care for it, adjust it and know how to determine if it fits properly and provides the appropriate protection.
- 3.2** The Safety Manager will provide employees with needed respirator training and instruction.
- 3.3** Such training and instruction will be given to any employee under Hilscher-Clarke's direct and immediate control if the employee has not already received it, or if the employee's prior training/instruction did not satisfy OSHA requirements, or if any doubt or question exists about respirator use or of any of the matters mentioned in this program.
- 3.4** Additional training (on a daily basis if necessary) will be provided by each Supervisor whenever it is needed to protect the health and safety of employees.
- 3.5** Each respirator wearer shall be given an opportunity to handle the respirator, have it fitted properly, test its facepiece-to-face seal, wear it in normal air for a period of time long enough to gain familiarity with it, have the respirator fit-tested as required by the applicable OSHA regulation and to wear the respirator in a test atmosphere.
- 3.6** Each respirator is accompanied by its own set of instructions for proper use, care and protection as well as its limitations. The instructions are printed in or on the respirator box, bag or container. These instructions must be observed.
- 3.7** Each respirator wearer must read and abide by these instructions.
- 3.8** Any employee who does not understand the respirator instructions must immediately ask his/her Supervisor for assistance.
- 3.9** Any employee who has not been provided with all of the training and instruction set forth above, or at any time is unsure about the respirator use, care or protection, or has any problems or difficulties with work while wearing a respirator, must inform his or her Supervisor at once so that the employee can be provided with the proper training and instruction.
- 3.10** Failure to follow all instructions and training on use, care and protection and/or failure to wear respirator during times of exposure can reduce respirator effectiveness and result in sickness or death. The vapors and mists that can be dangerous to health include particulates or gasses that may not be visible with the normal eye.
- 3.11** It is vital to each employee's health that the respirator training and instruction be observed; and it is vital to each employee's job.
- 3.12** Appropriate discipline will be taken against any employee who fails to observe any portion of Hilscher-Clarke's respirator program.
- 3.13** Persons who provide respirator training and instruction must make sure a written record is provided of the required training (Appendix A) and fit-testing (Appendix B).

## 4.0 Exclusive Employee Respirator Usage

- 4.1 All individuals who wear respiratory protective devices will be supplied with equipment for their exclusive use.
- 4.2 An exception to this practice may be permitted for equipment utilized for emergency or rescue purposes (Self Contained Breathing Apparatus (SCBA) and Powered Air Purifying Respirators (PAPR).
- 4.3 Exclusive use respirators will be marked with the employee name or some other identification to prevent cross contamination.

## 5.0 Medical Evaluation

- 5.1** All respiratory protection devices impose some kind of physiological stress on the user. Air-purifying respirators, for example, make breathing more difficult. People with heart or lung diseases or other health problems may be harmed by wearing a respirator. Many physicians also counsel pregnant patients against wearing respirators.
- 5.2** Any employee who uses a respirator will receive a *confidential* medical evaluation. A physician or other Licensed Health Care Professional (LHCP) will do the evaluation at no cost to the employee. The evaluation will be confidential and offered at a convenient time for the worker. The Affected Employee is free to ask the LHCP questions about the evaluation and will receive a copy of the LHCP's written determination.
- 5.3** Hilscher-Clarke will provide the LHCP with the following:
- The type and weight of the respirator the Affected Employee will use;
  - How long and how frequently the worker will wear the respirator;
  - How much physical work the Affected Employee will do while wearing the respirator;
  - What other Personal Protective Equipment the worker will wear;
  - The temperature and humidity of the working environment;
  - A copy of Hilscher-Clarke's respiratory protection program and a copy of OSHA standard 29 CFR 1910.134 and the applicable Appendixes.
  - A work and personal history form, on the Affected Employee, shall be provided to the physician at the time of examination (Appendix C).
- 5.4** The physician will determine if the employee is capable of wearing the selected respirator (Appendix D). The LHCP will send a written determination after the medical evaluation. Verbal responses are not acceptable. If the employee has a condition that limits respirator use or the worker needs a follow-up exam, the LHCP must include that information in the determination.
- 5.5** A follow-up medical evaluation is required when:
- The LHCP determines that wearing a respirator could adversely affect a worker's health;
  - A worker answers "yes" to any question on the work and personal history form;
  - A worker indicates problems wearing a respirator;
  - A worker changes jobs or tasks that require a different respirator;
  - A Supervisor or the Safety Manager has information that indicates a worker needs to be reexamined.
- 5.6** No employee will wear a respirator until a medical exam and fit testing are completed. (*Please note that an employee cannot be fit-tested until a LHCP has performed the medical evaluation and approved the employee for the actual fit-testing of a specific respirator*).
- 5.7** All medical records will be maintained according to the guidelines outlined in section 10.0 of this policy and procedure.
- 5.5.1** All Pre-evaluation Medical Forms, Physician's Respirator Use Evaluation Forms and other medical related respirator correspondence will be maintained in the strictest confidence, in a locked file with access restricted to the Company's Vice President and Human Resources. Designated representatives must present the proper authorization (in writing) before receiving access to said information.

## 6.0 Fit Test Requirements

- 6.1 Once an employee has passed the medical exam, a fit-test must be done before the employee uses a respirator.
- 6.2 The purpose of the fit test is to insure that the mask seals to the face and does not allow air contaminants to enter the mask between the skin and the respirator. An improperly fitting respirator does not protect the wearer.
- 6.3 The fit test must be performed by a “Qualified Person”.
- 6.4 The employee is to be fit tested with a respirator of the make, model, style, and size they will be using.
  - 6.4.1 They must be retested at least annually and whenever they change facepieces or they have a physiological change that could affect the face-to-facepiece seal.
- 6.5 There are three basic types of fit tests:
  - 6.5.1 Amyl Acetate (for respirators with organic vapor cartridges);
  - 6.5.2 Saccharine (for dust and fume masks or cartridges);
  - 6.5.3 Irritant Smoke (for dust and fume masks or cartridges).
- 6.6 If the primary method of fit-testing will be Amyl Acetate, it will be conducted in the following manner:
  - 6.6.1 A “Sensitivity Test” should be conducted to insure that the test subject can detect the test solution. The test subject should not eat, drink, chew gum, or any form of chewing tobacco for at least 15 minutes before the test.
  - 6.6.2 The subject should enter the test hood or test tent without a respirator.
  - 6.6.3 A very diluted amount of the test vapor should be injected into the booth or hood.
  - 6.6.4 Ask the test subject if he or she can smell the odor. If not, inject a comparable amount again. If the subject can smell the Amyl Acetate (banana like odor), the fit-test can proceed. If the subject cannot smell the odor, another method of fit-test such as irritant smoke or saccharine should be used.
  - 6.6.5 Once the subject has successfully completed the Sensitivity Test, he or she can go on to be fit-tested.
  - 6.6.6 If the subject does not already know which respirator is most likely to fit their face, three different sizes of respirator should be provided from which to choose. The selected respirator then will be fitted with an organic vapor cartridge. The test subject should put on the respirator and adjust the straps until an adequate fit is achieved. The negative and positive pressure fit-tests should be performed. A mirror should be provided so that the subject can visually check the fit.
  - 6.6.7 The subject should enter the test tent or put on the test hood. The Amyl Acetate solution should be injected into the tent or hood. The test subject should then perform the following six functions, each for 60 seconds:
    - **Normal breathing** – In the normal standing position, without talking, the subject shall do deep breathing for at least one minute pausing so as not to hyperventilate;
    - **Deep breathing** – In the normal standing position the subject shall do deep breathing for at least one minute pausing so as not to hyperventilate;
    - **Nodding head up and down** – Standing in place, the subject shall slowly move his/her head up and down between the extreme position straight up and the extreme position straight down. The head shall be held at each extreme position for at least five seconds. Do not bump respirator against chest. Perform for at least one minute.

## 6.0 Fit Test Requirements (cont.)

- **Turning head side to side** - Standing in place the subject shall slowly turn his/her head from side, between the extreme position, to each side. Perform for at least one minute. Do not hit respirator cartridges against shoulders or chest;
- **Reading** – The subject shall read out slowly and loud, so as to be heard clearly by the test conductor or monitor. The test subject shall read the “Rainbow Passage” (this passage was designed to incorporate all common facial movements made during speech):

*“When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow.”*

- **Bend over and touch toes** – The test subject shall bend at the waist and touch toes and return to upright position. Repeat for at least one minute.
- **Jogging in place** – The test subject shall perform “jog in place” for at least one minute.
- **Normal breathing** – Same exercise as (1) above.

**6.6.8** There are additional requirements when fit testing for asbestos, benzene and formaldehyde. OSHA’s Code of Federal Regulations should be consulted for these additional requirements. Also, reference the MSDS sheet.

**6.6.9** If at any time during any of these activities the test subject detects the odor of the testing agent, the fit is inadequate.

**6.6.10** A subject may begin the test again, only after a fifteen minute interval. A second failure of the test indicates serious fit problems.

**6.6.11** Another fit-test with another mask may be undertaken, but there must be at least a 24 hour interval between the twice-failed test and a subsequent test.

**6.6.12** In the event the banana oil test, in the opinion of the person conducting the test, is for any reason untrustworthy, the irritant smoke test will be conducted.

**6.6.13** If the entire test is completed without the test subject detecting the odor of the testing agent, the test is passed and the respirator selected is judged adequate.

**6.6.14** A record of the test(s) will be kept on a Respirator Fit Test Record (Appendix E).

**6.7** If hair growth or apparel interferes with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit. If a satisfactory fit is still not attained, the test subject must use a positive-pressure respirator such as a powered air-purifying respirator, supplied air respirator or self-contained breathing apparatus.

**6.8** The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface.

**6.9** Even if a test subject has passed a medical exam, if he or she exhibits difficulty in breathing during the tests, he/she shall be referred to a physician trained in respirator disease or pulmonary medicine to redetermine whether the test subject can wear a respirator while performing her or his duties.

## 7.0 Inspection, Cleaning, Storage and Repair of Respirators

- 7.1 Each employee who has finished wearing a disposable respirator, or a respirator that is to be used only once, shall place the respirator in the appropriate trash or disposal container. It shall not be taken from the premises for additional use or used a second time under any circumstances.
- 7.2 Respirators that are routinely used shall be regularly cleaned and disinfected by the respirator user. Clean and disinfect respirators as follows:
  - 7.2.1 Remove all cartridges, canisters, and filters, plus gaskets or seals not affixed to their seats. Cartridges will be discarded;
  - 7.2.2 Remove elastic head bands;
  - 7.2.3 Remove exhalation cover;
  - 7.2.4 Remove speaking diaphragm or speaking diaphragm-exhalation valve assembly;
  - 7.2.5 Remove inhalation valves;
  - 7.2.6 Wash facepiece and breathing tube in cleaner/sanitizer recommended by the manufacturer with warm water, use manufacturers recommended temperature;
  - 7.2.7 Wash components separately from the facepiece, as necessary.
  - 7.2.8 Remove heavy soil from surfaces with a hand brush.
  - 7.2.9 Cleaner/sanitizer(s) should be located adjacent to each respirator storage facility.
- 7.3 No one should ever use a respirator that has previously been used by another person, without first cleaning and disinfecting the respirator.
- 7.4 Cartridges and canisters shall always be stored in their sealed plastic bags until ready for use. Canisters will be stored with original seals intact in the upright position.
- 7.5 Before putting a respirator on, the user shall inspect the respirator for defects and cleanliness. The must be done every time a respirator is put on.
- 7.6 The respirator should be inspected, after taking it off, prior to putting the respirator in storage.
- 7.7 Each respirator not routinely used, but kept ready for emergency use, shall be inspected after each use and at least monthly to assure it is in satisfactory working condition.
- 7.8 An employee must never wear an unclean respirator or a respirator that is in any way defective.
- 7.9 Each employee must report any instance of a defective or ineffective respirator to his or her Supervisor immediately.
- 7.10 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 elastomer parts with a massaging action will keep them pliable and flexible and prevent them from “setting” during storage.
- 7.11 Any employee who does not know how to properly inspect, and clean, his or her respirator must ask a Qualified Person or Supervisor for assistance.
- 7.12 Respirator repairs and part replacement shall only be done by experienced persons. There shall be no interchanging of parts; replacement parts shall be approved for the particular respirator in use.
- 7.13 Attempts to replace components or make adjustments or repairs beyond the manufacturer’s recommendations shall not be made.
- 7.14 Reducing valves or regulators shall be returned to the manufacturer or to a trained technician for adjustment or repair.
- 7.15 No repairs shall be made to air purifying respirators. If air purifying respirators are damaged or missing parts they should be disassembled and discarded and a new respirator will be issued.

## 7.0 Inspection, Cleaning, Storage and Repair of Respirators (cont.)

- 7.16** Repairs to SCBA or PAPR should only be performed by a trained individual and according to applicable manufacturer's direction.
- 7.17** SCBA's and all Emergency Egress Respirators shall be inspected, at a minimum, on a monthly basis and before or after each use to assure they will perform satisfactorily:
- 7.17.1** Inspections of emergency use respirators shall be recorded on the form titled "Emergency Use Respirator Inspection" (Appendix F);
- 7.17.2** Inspection records shall be maintained for each SCBA/Emergency Egress for seven years.
- 7.18** When not in use, each respirator shall be stored in a manner to protect it against dust, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals.
- 7.19** Clearly marked storage locations shall be assigned to each person who has been issued a respirator. All inspected, cleaned, sanitized and repaired respirators shall be stored according to the following guidelines:
- 7.19.1** Respirators must be protected from dust, sunlight, heat, extreme cold, excessive moisture, and damaging chemicals. Most air purifying respirators can be stored in a clean plastic bag until they are used;
- 7.19.2** Emergency use respirators shall be stored in a cabinet or case located in a non-contaminated, but readily accessible area.
- 7.20** Respirators must be stored so 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.
- 7.21** Dust respirators must be stored in a sealed, clean, plastic bag.
- 7.22** Respirators shall never be stored in such places as lockers or tool boxes unless they are in clean carrying cases or cartons and the cleaning and storage conditions listed above can be assured.
- 7.23** No employee shall remove a respirator from the premises unless directed to do so by his or her immediate supervisor.

<b>Quick Reference Schedule For Cleaning, Inspecting, &amp; Storing Respirators</b>			
<b>Situation/Use</b>	<b>Cleaning and Disinfecting</b>	<b>Inspecting</b>	<b>Storage</b>
<b>Exclusive Use</b>	Clean and disinfect as often as necessary to keep sanitary.	Inspect before each use and during cleaning.	Store safe from contamination; make sure valves and facepieces aren't deformed.
<b>More Than One User</b>	Clean and disinfect before another worker uses it.	Inspect before each use and during cleaning.	Store safe from contamination; make sure valves and facepieces aren't deformed.
<b>Emergency Use</b>	Clean and disinfect after each use.	Inspect at least monthly according to manufacturers recommendations; inspect escape-only respirators before each use.	Same as above; also, keep readily accessible and clearly identify as "For Emergency Use Only."
<b>Training &amp; Testing</b>	Clean and disinfect after each use.	Inspect at least monthly; inspect escape-only respirators immediately before each use.	Store in place and manner free from contamination; make sure valves and facepieces aren't deformed.

## 8.0 Self-Contained Breathing Apparatus (SCBA's)

**8.1** A self-contained breathing apparatus (SCBA) provides 15 to 60 minutes of breathable air from a self-contained cylinder. SCBA's are ideally suited for emergency rescue operations but the limitations on air supply makes it a less desirable source of air for normal work operations of extended duration.

### **8.2 General:**

**8.2.1** Only Type 1 - Grade D breathing air shall be used in the cylinders. The Safety Manager will coordinate deliveries of compressed air with Hilscher-Clarke's vendor (Prax Air) and require the vendor to certify that the air in the cylinders meets the specifications of Type 1 - Grade D breathing air.

**8.2.2** Compressed oxygen cannot be used in atmosphere-supplying respirators that have previously used compressed air.

**8.2.3** Oxygen concentration greater than 23.5 % must be used only in equipment designed specifically for oxygen use.

**8.2.4** Cylinders that supply breathing air must meet specific maintenance, air quality, and moisture content requirements.

**8.2.5** Breathing air couplings must not fit outlets for nonbreathable air.

**8.2.6** Breathing gas containers must be marked in accordance with the NIOSH respirator certification standard, 42 CFR Part 84.

### **8.3 Breathing Air Cylinders:**

**8.3.1** Air cylinders must be marked legibly on the neck ring per DOT 49 CFR Section 173 and 178. SCBA cylinders use the following marking scheme on the sidewall near the valve end:

- DOT exemption number or Canadian Transportation Commission (CTC) or Transport Canada (TC) special permit number followed by service pressure;
- Manufacturer's serial number;
- Inspector's mark just below or immediately following the serial number;
- Manufacturer's identification;
- Date of original test.

If this label is missing, the cylinder must be condemned. If any of the required markings are illegible, the Safety Manager or applicable "Competent Person" should be contacted as soon as possible. Retest markings and original markings that are becoming illegible may be stamped on a metal plate permanently secured to the cylinder.

**8.3.2** In addition to the stamped marks, cylinders filled by the local vendor, PraxAir, are labeled with stickers marked "**Warranted Breathing Air**". This label differentiates between regular breathing air and oxygen per Food and Drug Administration requirements.

**8.3.3** Cylinders shall be tested and maintained as prescribed in the Shipping Container Specification Regulations of DPT (49 CFR Part 178).

**8.3.4** Each SCBA will be inspected monthly by the Safety Manager as outlined in Appendix I.

## 8.0 Self-Contained Breathing Apparatus (cont.)

**8.3.5** Emergency escape respirators only provide a 5 minute supply of air. These units are only permitted for escape purposes and are not to be used for entry into an IDLH atmosphere under any circumstances.

- The 5-minute escape packs are inspected on a monthly basis by the Safety Manager. The hoods are checked for cracks and discoloration and the gauges are checked for pressure. Defective units are tagged and removed from service immediately.

## 9.0 Air Line Respirators

- 9.1** *Air line respirators without escape capabilities are only to be used in atmospheres where air contaminant concentrations are not IDLH.* This limitation is necessary because the air supply is solely dependent upon an outside source, which is not readily available to the wearer.
- 9.2** The compressor should be located and constructed to avoid entry of contaminated air. The air system will be equipped with filters, sorbent beds and alarm systems as necessary to ensure Type 1 - Grade D breathing air is supplied.
- Sorbent beds and/or filters are to be maintained and/or replaced following manufacturer's instructions.
  - Compressor will be tagged with the information on the most recent change date of the filter and an authorizing signature (i.e., Safety Manager, Competent Person).
- 9.3** The compressor will be equipped with a carbon monoxide alarm which will monitor the air to prevent the carbon monoxide in the breathing air from exceeding 10 ppm. The air should then be dried.
- 9.4** The system needs to be equipped with a compressor capable of supplying air at 110-115 psig at the outlet of the purification system.
- 9.5** The system shall be equipped with a low pressure alarm when buffer tank pressure drops below 85 psig.
- 9.6** Air line couplings shall be incompatible with outlets for other gas systems to prevent inadvertent servicing of air line respirators with non-respirable gases or oxygen.

## 10.0 Data, Records, and Records Retention

- 10.1 OSHA regulations require that nonconfidential medical evaluation determinations, fit testing, training documentation, and annual inspection audits be retained in a format that allows easy and logical access. All original data pertaining to fit testing and respirator training will be kept on file at Hilscher-Clarke's base of operations in the Human Resources office.
- 10.2 All documentation is arranged (filed) by employee.
- 10.3 Records shall be kept on each employee who receives training and fit testing. This record will include the name, Social Security Number, location of respirator use, type of contaminant(s), respirator type, tester, medical evaluation and results of fit testing (See Appendix Section).
- 10.4 Medical records of all employees subject to fit testing shall be maintained by the Licensed Health Care Provider.
- 10.5 **Transfer of Records: If Hilscher-Clarke ceases to do business and there is no successive employer to receive and retain the records for the prescribed period, the employer shall notify the Director of the National Institute for Occupational Safety and Health (NIOSH) at least three (3) months prior to scheduled record disposal and prepare to transmit them to the Director.**
- 10.6 Regulatory compliance data such as personal fit testing and respirator training will be retained indefinitely.

# *Appendix*



## Protect Your Lungs

Respirators can prevent fibers, mists, fumes, dusts, powders, gases, vapors and other contaminants from getting to your lungs. You might notice the effects of contaminants right away, but there are also dangerous long-term effects of buildup over time. Using the right respirator in the right situation is your key to good health.

### **Air-Purifying Respirators (APR)**

This broad class of respirators includes any device that filters or purifies the air. They come in half-masks, which cover your nose and mouth or full-face masks, which also cover your eyes.

#### **Particle-Filtering**

This type of APR contains a filter designed to screen out contaminants such as dust, fumes, mists, fibers and powders. The respirator may be a simple, loose-fitting disposable mask or a rubber mask fitted with disposable or cleanable filters. These masks don't protect against gases or oxygen deficiency.

#### **Vapor & Gas Removing**

This type of APR is fitted with a cartridge or canister containing chemicals designed to absorb or chemically reduce dangerous

gases and vapors. A valve allows air you exhale to escape and then closes so contaminated air can't enter. The particular cartridge or canister you use must be specific for the type of gas or vapor in your work area—the wrong one will not protect you.

#### **Supplied-Air Respirators (SAR)**

If the atmosphere in your work area has such a high level of contaminants that there's not enough oxygen in the air, you must use this type of respirator. Supplied-air respirators also called air-line respirators, connect you by an air hose to an outside source of clean air supplied by a compressor or compressed-air cylinder.

This type of respirator is also used when contaminants can't be filtered or absorbed by APR's. Other situations requiring SARs are

environments that are dangerously hot or cold or so toxic that they've been identified as "immediately dangerous to life and health." Under these conditions, you must use a respirator with positive air pressure so there's no chance of contaminants being drawn into the mask when you inhale.

#### **Self-Contained Breathing Apparatus (SCBA)**

With a self-contained breathing apparatus you carry a supply of air in a portable tank on your back. This type of protection is used when you need great mobility, when falling objects or machinery can damage an air hose or when the job to be done takes 30 minutes or less. SCBAs are also used to explore an environment where the air quality is unknown.

#### **Things To Remember**

- ▶ Use the appropriate (NIOSH/ANSI Approved) respiratory equipment for the job.
- ▶ Use the proper filters, cartridges or canisters for the respirator and contaminants.
- ▶ If you wear glasses with a full-face mask respirator, you may need a specially modified model.
- ▶ Contact lenses should not be worn with a respirator since pressure changes can pull them off your eyes.
- ▶ If you experience difficulty breathing, fatigue, irritation in your eyes or respiratory system, dizziness, illness or an unusual odor or taste when using your respirator, leave your work area immediately and report to your supervisor. These could be signs that your respirator is not working properly.

Protect Your Lungs  
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*This form is to be presented to the physician by the employee.*

			Date	
Last Name		First Name, Middle Initial	SS #	
D.O.B.				
Weight	Height			
	ft.	in.		
Have you ever had or do you now have any of the following? (mark an "X")				
Yes	No	Don't Know	Description	Comments
			Lung Disease	
			Persistent Cough	
			Shortness of Breath	
			Heart Disease	
			History of Fainting or Seizures	
			High Blood Pressure	
			Diabetes	
			Fear of Close/Tight Places	
			Smothering Sensations	
			Heat Stroke or Heat Exhaustion	
			Ruptured Ear Drum	
			Defective Hearing	
			Wear Corrective Lenses	
			Other Problems With Your Eyes	
			Do You Smoke?	
			Any other conditions that might interfere with the use of a respirator or limit your ability to work? If yes, explain:	
List any medications that you are presently taking:				
Employee Signature:				Date:

## Physician's Evaluation

Employee Name: \_\_\_\_\_

Employee SSN: \_\_\_\_\_

Evaluation (check appropriate box):

- No restrictions on respirator use.
- Restrictive use.
- Not approved to use a respirator.

Restrictions or comments:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(Physician's Name – Please Print)

\_\_\_\_\_

Physician's Signature

\_\_\_\_\_

Date

\_\_\_\_\_

To Be Completed By The Examining Physician

## Qualitative Fit Test Record

Name:	Employee ID/SSN:	Date:			
Respirator:			Size:		
Respiratory Hazards Encountered:					
Sensitivity Test			Results		
			Pass	Fail	N/A
Isoamyl Acetate (Banana Oil)					
Saccharin #Squeezes      10 ( )    20 ( )    30 ( )					
Bitter Aerosol #Squeezes    10 ( )    20 ( )    30 ( )					
Irritant Smoke					
Fit Test Agent		Filter/Cartridge (i.e., Organic Vapor, Particulate Filter, 100 Level Particulate Filter)		Results	
				Pass	Fail
Isoamyl Acetate					
Saccharin					
Bitter Aerosol					
Irritant Smoke					
Comments:					
Test Conductor:				Employee Signature:	

## Respirator Inspection Record

Type of Respirator \_\_\_\_\_ NIOSH No. \_\_\_\_\_

Date of Inspection \_\_\_\_\_ Name of Inspector \_\_\_\_\_

Defects Found (Mark all appropriate boxes and give detailed description):

- Facepiece \_\_\_\_\_
- Inhalation Valve \_\_\_\_\_
- Exhalation Valve Assembly \_\_\_\_\_
- Headbands \_\_\_\_\_
- Cartridge Holder \_\_\_\_\_
- Cartridge/Canister \_\_\_\_\_
- Filter \_\_\_\_\_
- Harness Assembly \_\_\_\_\_
- Hose Assembly \_\_\_\_\_
- Speaking Diaphragm \_\_\_\_\_
- Gaskets \_\_\_\_\_
- Connections \_\_\_\_\_
- Other Defects \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Repairs/Modifications (must be described in detail):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Respirator Fit and Maintenance

Your respirator safety on the job depends on you wearing a properly functioning and fitting respirator. Tell your Site Foreman if your respirator interferes with your ability to see, hear or be heard properly, if it restricts movement so that you can't safely do your job, or if it has any damaged or worn parts. Only NIOSH and/or ANSI approved respirators are permitted for use.

### Checking The Fit

- Whether you use a full-face respirator or one that covers only your nose and mouth, choose a respirator that's the right size for you and feels comfortable.
- Don't try to make a respirator more comfortable or better-fitting by altering it in any way or repairing it with parts from another respirator.
- Follow instructions for putting it on, adjusting the straps if necessary.
- When a respirator fits properly, the soft, pliable edges of the mask will mold to form a seal to your face, preventing contaminated air from entering.
- Adjust disposable fiber masks by pinching the metal nose strip to fit around your nose.
- Make sure no hair sticks out from the edges of your face mask. Beards, mustaches and long sideburns can interfere with the seal.



### Testing the Seal

Perform these tests each time you use your respirator. Enter your work area only if your respirator passes the tests.

#### Positive Pressure Test

Cover the exhalation valve so that air can't escape through it; then exhale gently. The mask will bulge and you should feel increased air pressure until you inhale or uncover the valve. This means that no air is escaping the mask.

#### Negative Pressure Test

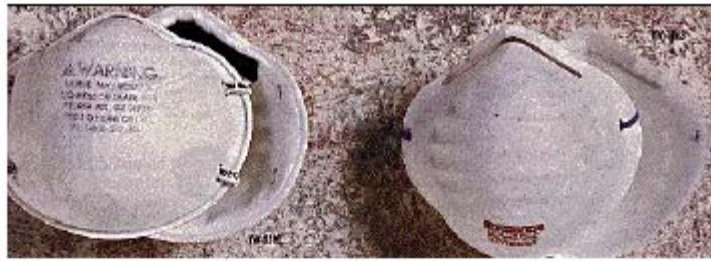
Cover the air intake ports of the respirator with your palms and inhale. Not only should it be difficult to inhale, but the soft parts of the respirator should collapse inward toward your face and remain that way as long as you're inhaling. This means that no air is getting into the mask from the edges. If you feel air coming in, and the mask regains its shape, there's a leak that must be corrected before you use the respirator.

### Respirator Maintenance

- Test your respirator's fit regularly.
- Check filters, cartridges or canisters before each use.
- Regularly check for cracks, dents, holes, hardening and broken or worn straps or buckles.
- Replace elastic straps that have lost their stretch.
- Replace your respirator if the material around the edges has become hard and brittle.
- Replace cartridges or canisters, valves and hoses according to the manufacturer's guidelines.
- Avoid changing parts from one model to another.
- Use only approved parts.
- Make sure cartridges are threaded correctly into place.
- Do pressure tests after replacing cartridges or filters.
- Keep valves clean and functioning properly.
- Replace dry or cracked valves.
- Clean your respirator after each use.
- Wash in mild, soapy water and scrub with a soft brush.
- If sanitizing, leave your respirator in the solution for at least 2 minutes and rinse thoroughly.
- Never use solvents or harsh cleaning agents on rubber or plastic parts.
- Replace your disposable respirator when it becomes clogged or breathing becomes difficult.
- Store your respirator in a plastic bag away from sunlight and chemicals.
- Avoid placing objects on top of your respirator.

Respirator Fit/pub  
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## The Types of Respirators used at Hilscher-Clarke are:



**Disposable or Single Use Type**



**Negative Pressure Air Purifying**



**Powered Air Purifying  
Respirator (PAPR)**



**Air-Line**



**Self-Contained  
Breathing Apparatus (SCBA)**

The Types of cartridges used on air purifying respirators are:

- Dust, Particulate – welding, cutting, nuisance dust;
- HEPA – Asbestos and radionuclides, lead, silica;
- Organic – Solvent vapors;
- Acid Gas – Hydrogen sulfide, chlorine, sulfur dioxide.

Only National Institute of Occupational Safety and Health (NIOSH) approved type respirators shall be used by Hilscher-Clarke to protect employees from airborne contaminants. The respirators shall be selected to provide the protection factor to achieve compliance with a PEL for the particular airborne contaminant(s).

## Monthly & Pre-Use SCBA Inspection Checklist

**Any unit failing this test will be tagged and immediately removed from service.**

Please answer all questions. Failure to answer any question on any unit will immediately render the unit inoperable and the unit shall be tagged and immediately removed from service. Questions regarding this inspection should be answered by the Safety Manager and/or designated "Competent Person".		
Name of Inspector:	Date of Inspection:	SCBA ID No.:
Physical Location of Unit:		
<b>Yes</b>	<b>No</b>	<b>Description</b>
		Are body straps in good condition and free from frays or splices?
		Are straps loosened as much as possible to allow for ease in donning SCBA?
		Is the inhalation valve diaphragm free of cracks, holes or leaks?
		Is the facepiece clean and free of debris, dust and excessive scratches?
		Is the hose connected to the facepiece clean and free of cracks, holes and obstructions?
		Is air tank full? Check the pressure gauge of the cylinder; it should be in the "full" position; if not replace with a full tank.
		Does the alarm bell work?
		Is the bypass valve closed, and is the mainline switch open (for Scott 2A's only)?
		Do the air supply gauge and cylinder pressure gauge work properly?
		Does the regulator work properly?
		Is the pressure demand valve in the off-position (for Scott 2A's only)?
<b>Comments</b> (repairs/modifications should be addressed in detail):		