ASSURANCE CONSTRUCTION & SERVICES

RESPIRATORY PROTECTION CODE OF PRACTICE

REVIEWED NOVEMBER 10 2015 OH&S Code Part 2 & Part 18 Sections 244 - 254

Our company is committed to promoting the health, safety and well-being of its employees as well as providing a safe and healthy building environment in which to conduct activities, in accordance with our company's Health, Safety & Environmental Policies.

Our company will meet or exceed the legislated requirements made under the Alberta Occupational Health and Safety Act, Regulation and Code.

Our company is committed to the protection of workers from occupational hazards, including the Potential health risks associated with exposure to airborne contaminants. Our goal is the control of airborne contaminants by accepted engineering and administrative work practice control measures and if necessary appropriate respiratory protection must be used. Personal Protective Equipment (PPE), including respirator protection, is normally the last resort in minimizing the hazards of airborne contaminants.

The Respiratory Protection Program includes the following elements:

- Hazard identification, assessment and control.
- Types of respiratory protection equipment.
- Selection of respiratory protection equipment.
- Use, care and maintenance of respiratory protection.
- Fit Testing and Training requirements.
- Emergency Response procedures.
- Communication plan for occupants and others in the building.
- Worker health assessment.
- Documentation.

HAZARD IDENTIFICATION, ASSESSMENT AND CONTROL

A written hazard assessment must be completed, communicated and understood by all individuals involved in the work area. The written hazard assessment is important to determine if respiratory protection is needed and the selection of the correct type.

AIRBORNE HAZARDS

Respiratory hazards may include airborne contaminants such as dusts, mists, fumes, and gases, or oxygen-deficient atmospheres. While there are many non-occupational sources of airborne contaminants, there are also many materials that become airborne in an occupational setting.

Inhalation is generally the most significant route of entry for toxic materials in most workplaces. Specific airborne hazards that workers are exposed to will vary and depend upon their occupation.

Airborne hazardous materials can be separated into 4 different classifications:

1. Particulates/aerosols (solid particles, dusts, fibers, mists, droplets, fumes)
2. Gases and/or vapors (gaseous contaminants, vapors)
3. Oxygen-deficient atmospheres (containing less than 19.5 % oxygen).
4. Combination (any combination of particulates, gases, and/or vapors, including oxygen deficient atmospheres)

HAZARD ASSESSMENT AND CONTROL

Hazard assessment is a formal process for identifying all existing and potential hazards at a work site and then determining the degree of danger (the risk) the hazards pose to workers. (FORM I-1 Field Level Hazard Assessment.)

Hazards can be classified into the following categories:

1. Physical hazards - lifting, slipping & tripping, falls, fire, electricity, noise, mechanical, kinetic, ergonomical, temperature, weather.
2. Chemical hazards - solvents, acids, epoxy paint, cleaners etc.
3. Biological hazards - tissues, bacteria, blood and body fluids etc.

All categories should be considered for inclusion in the hazard assessment.

Once workplace hazards have been identified and rated, hazard controls must be put in place to reduce the risk workers face from exposures to the hazards.

ENGINEERING CONTROL METHODS

Engineering control measures remove or reduce the hazard by initial engineering design specifications or by applying methods of substitution, isolation or ventilation. Well designed and maintained engineering controls are the preferred methods of controlling worker exposure to hazardous contaminants in the air.

Engineering control methods include:

- Mechanical ventilation.
- Adding clean air to oxygen-deficient space.
- Enclosure or Isolation of the process or work equipment.
- Proper control and use of process equipment.
- Process modifications including substitution with less hazardous materials where possible.

FUME HOOD AND LOCAL EXHAUST SYSTEMS

Local exhaust ventilation, like fume hoods, canopy hoods, slot hoods and other local exhaust systems are an important technique for controlling worker exposures to airborne contaminants.

ADMINISTRATIVE CONTROL METHODS

Administrative controls may be used in addition to engineering controls. Administrative control methods minimize worker exposure by scheduling reduced work times in contaminant areas, good work practices and worker training. Appropriate training includes hazard recognition and work practices specific to the worker's job that can assist in reducing exposures. These control measures have many limitations since the hazard is not eliminated or removed. Administrative controls are not generally favored because they can be difficult to implement, maintain, and are not reliable. Administrative controls are anything that is written or could be written including signage, training, safety rules, Provincial Safety Standards, HAA, etc.

PERSONAL PROTECTIVE EQUIPMENT

Protective equipment may only be used where airborne hazards cannot be eliminated or sufficiently reduced with engineering or administrative controls. Respirators are the least satisfactory means of exposure control because they only provide good protection if they are properly selected, fit tested, worn by the workers, and replaced when their service life is over. In addition, some workers may not be able to wear a respirator due to health or physical limitations. Respirators can also be cumbersome to use and hot to wear, and they may reduce vision and interfere with communication.

Despite these difficulties, respirators are the only form of protection available in the following situations:

- During the installation or implementation of feasible engineering and work practice (administrative) controls.

- In work operations, such as maintenance and repair activities for which engineering and work practice controls are not yet sufficient to reduce exposure to or below the Occupational Exposure Limit (OEL).
- In emergencies.

Personal protective equipment can be used in conjunction with engineering controls and other methods of control to minimize potential exposures.

Every worker in an area with airborne contaminants that are or may potentially be over 50% of the
Occupational Exposure Limit must wear appropriate personal protective equipment. Workers must use:

- Appropriate respiratory protective equipment.
- Protective clothing (laboratory coats, Tyvek suits etc) to reduce the risk of contaminating street clothing, skin and hair.
- Other protective equipment such as eye protection, hard hats, hearing protection and steel toe footwear as site conditions, regulations, or the hazard assessment requires.

The supervisor must ensure that personal protective equipment provided to workers will not cause medical problems (e.g. latex allergies, breathing difficulties).

TYPES OF RESPIRATORY PROTECTIVE EQUIPMENT

Respiratory protective devices can be described based on their capabilities and limitations and places in three classes:

- Self-Contained Breathing Apparatus (SCBA)
- Air-Supplying Respirators
- Air-Purifying Respirators

Self-Contained Breathing Apparatus (SCBA)

The self-contained breathing apparatus (SCBA) provides respiratory protection against gases, vapors, particles and an oxygen deficient atmosphere. The wearer is independent of the surrounding atmosphere because the breathing gas is carried by the wearer. SCBA may be used in IDLH (immediately dangerous to life and health) situations and oxygen-deficient atmospheres either as escape-only devices or for entry into and escape from these atmospheres.

There are two major types of SCBAs:

1. Closed-Circuit SCBA
2. Open-Circuit SCBA

Closed-Circuit SCBA

In a closed-circuit SCBA, all or a percentage of the exhaled gas is scrubbed and re-breathed. Closed-circuit SCBAs are designed to provide 30 minutes to 4 hours of service.

Open-Circuit SCBA

In an open-circuit SCBA, the exhaled breath is released to the surrounding environment rather than being re-circulated. The breathing gas is generally compressed breathing air. Typically they are designed to provide 30-60 minutes of service. Only full-face piece, pressure demand (positive pressure) SCBAs are approved for immediately dangerous to life and health (IDLH) atmospheres.

Escape SCBA

Some SCBAs are designed for escape only and are similar in design to the closed-circuit and open-circuit SCBA types. Their time of use tends to be shorter, typically 5, 7, or 10 minutes. Escape-only units CAN NOT be used to enter into a hazardous atmosphere.

Air-Supplying Type

Air-supplying types of respirators provide a safe atmosphere to the wearer, independent of the ambient air. The breathing source is supplied from an uncontaminated source through a hose connected to the wearer's face piece or head enclosure from a compressor or compressed air cylinders. These devices may only be used in non-IDLH atmospheres or atmospheres in which the wearer can escape without the use of a respirator. If the air supply fails, the wearer may have to remove the respirator to escape from the area.

In IDLH and oxygen deficient atmospheres, a combination SCBA and air-line respirator may be used since the auxiliary SCBA can be switched to in the event the primary air supply fails to operate and allows the wearer to escape from the IDLH atmosphere.

Air-Purifying Respirators

Air-purifying devices clean the contaminated atmosphere. Ambient air passes through an air-purifying element (by filtration or absorption) that can remove specific gases and vapors, aerosols, or a combination of these contaminants. This type of device is limited in its use to those environments where there is sufficient oxygen and the contaminant's airborne

concentration level is within the maximum use concentration of the device. The useful life of an air-purifying device is limited by the concentration of the air contaminants, the breathing rate of the wearer, temperature and humidity levels in the workplace, and the removal capacity of the air-purifying medium.

Air-purifying respirators can be of three types:

- Aerosol (Particle) Removing Respirator
- Gas/Vapour Removing Respirator
- Combination Aerosol Filter/Gas or Vapour-Removing Respirator

Air-purifying respirators cannot be used in IDLH environments because there are limits to the amount of contaminants they can remove. Air-purifying respirators are not appropriate for use in oxygen-deficient atmospheres since they do not supply oxygen and may only be used when the ambient atmosphere contains at least 19.5% oxygen.

Air-purifying respirators are not appropriate for use as protection against materials with poor warning properties (substances that cannot be detected by the respirator wearer by smell, taste or feel) since concentrations inside the respirator may unknowingly reach unsafe levels. The detection of contaminants inside a respirator is called breakthrough. There are some exceptions to this rule; asbestos, silica and radioactive particles are each potential carcinogens with no warning properties but for which the use of air-purifying respirators are adequate up to certain concentrations.

Half Face Respirators

Half face respirators fit under the chin to the bridge of the nose. They are more comfortable in some situations, but may be more difficult in terms of fitting well around a worker's nose, chin and cheeks. Air is drawn through the cartridge or filter by negative pressure that is created inside the respirator face piece when the user inhales.

Full-Face Respirators

Full-face respirators provide a higher level of protection and a better fit than half-face respirators. Full face respirators fit over the entire face, from the hairline to under the chin, and offer eye protection. Air is drawn through the cartridge or filter by negative pressure that is created inside the respirator face piece when the user inhales.

Dust Masks

Dust masks are disposable half face particulate filter respirators. They are also known as a filtering face piece respirator commonly used in health care and construction/renovation applications. Air is drawn through the filter by negative pressure that is created inside the dust mask when the user inhales.

Powered Air-Purifying Respirators

Powered air-purifying respirators (PAPR) are a variation on air-purifying respirators. A PAPR utilizes a battery-powered blower that draws the contaminated air through the cartridge or filter. The cleaned air is then forced through a hose to the face piece which may be tight-fitting or a helmet or a hood that does not seal tightly against the face of the wearer. PAPRs supply purified air at a positive pressure, which means if a leak occurs in the face piece, helmet, or hood, air should move outward. PAPRs provide the same level of protection as a negative-pressure air-purifying respirator.

SELECTION OF RESPIRATORY PROTECTIVE EQUIPMENT

Respirator selection is based upon a systematic review of the airborne contaminant hazards. Knowledge of standards, regulatory criteria, and manufacturer's information on the types of respirators and limitations must be reviewed to ensure that appropriate accepted respirators are selected for the intended conditions of use. All respiratory protective equipment must be NIOSH approved (National Institute for Occupational Safety and Health) and labeled as such.

The Respiratory Equipment Selection Flowchart is based on the assigned protection factors for air supplying and air purifying respirators. Prior to using the Respiratory Equipment Selection Flowchart, a number of factors need to be carefully considered when selecting the appropriate type of respiratory equipment. It is very important to assess all these factors for each situation each time equipment is being chosen. Always take into consideration whether or not the equipment is going to be used for emergency conditions. Gather and document this information on the Respirator Selection Information Form.

HAZARD IDENTIFICATION

Each type of respirator is designed for use under specific environmental conditions and is appropriate for only a certain class or type of respiratory hazard.

IDENTIFY THE AIRBORNE CONTAMINANT(S)

The potential airborne contaminants must be known to ensure the respirator selected is approved for protection against that specific contaminant.

If the respiratory hazard or worker exposure cannot be identified, the atmosphere must be considered Immediately Dangerous to Life and Health (IDLH).

DETERMINE THE CONTAMINANT(S) CONCENTRATION(S)

Determine worker exposure concentration(s) of the average workday and the highest short-term concentration(s) of the contaminant by measuring or estimating the airborne concentrations of contaminants to which workers may be exposed. Anticipated exposures should account for variations in process operation, rate and direction of air movement, temperature (ambient or process), and season.

Measurement includes air sampling and analysis conducted in accordance with accepted practice.

Estimation includes mathematical modeling or estimating based upon the workplace volume, air supply and exhaust, and physical properties (i.e. vapor pressure) or experience from similar circumstances and materials.

Alberta Occupational Exposure Limits (OELs) for chemical substances are available in Schedule 1, Table 2 of the Occupational Health & Safety Code located at the back of the Code.

Warning Properties

The published warning properties of each contaminant, if existing, must be identified and are usually found on the product's Safety Data Sheet (MSDS). Adequate warning properties can be assumed when the odor, taste, or irritation effects of the contaminant are detectable and persistent in concentrations at or below the occupational exposure limit (OEL). When the odor, taste, or irritation threshold of a contaminant is greater than the OEL, the contaminant should be considered to have poor warning properties.

Workers need to know the concentration at which most people can detect the substance by smell, or by nose or throat irritation. When a worker detects the contaminant this way, it indicates the respirator fits poorly, has developed a leak, or has exhausted its cartridges or canister. For this reason, air-supplying respirators should be used for protection against gases or vapors that have poor warning properties at or above their OELs.

For contaminants with poor warning properties, air-purifying respirators may only be used if:

- The respirator cartridge is equipped with an end-of-life indicator; or

- A qualified person calculates the change-out schedule using product information from the manufacturer or estimates based on knowledge of the effectiveness of the cartridge to remove the contaminant. The calculation method used must be the U.S. Occupational Safety and Health Administration (OSHA) model or an equivalent method.
- There are exceptions to the rule, including asbestos, silica and radioactive particles are potential carcinogens with no warning properties but for which the use of air-purifying respirators are adequate up to certain concentrations.

Skin or Eye Absorption and Irritation Characteristics

Determine if the contaminant is an eye irritant at concentrations normally encountered in the workplace or anticipated in an emergency. Determine if information is available by reviewing the SDS, indicating possible systemic injury resulting from absorption of the contaminant through the skin or eyes.

Some substances may have a potential significant contribution to the overall exposure by the cutaneous route, including mucus membranes and the eyes, by contact with vapors, liquids, and solids. Chemicals which pass through the skin are nearly always in liquid form. Solid chemicals and gases or vapors do not generally pass through the skin unless they are first dissolved in moisture on the skin's surface.

Overexposure may occur following dermal skin contact, even when airborne exposures are at or below the OEL. Air sampling alone may be insufficient to quantify exposure accurately and control measures to prevent significant skin absorption may be required.

HAZARD ASSESSMENT

<u>Immediately Dangerous to Life and Health (IDLH)</u>

An IDLH atmosphere is one that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape. Very high concentrations of acutely toxic substances, very low concentrations of atmospheric oxygen or concentrations in excess of the lower explosive limit (LEL) are examples of IDLH situations. IDLH situations require the use of positive-pressure air-supplying respiratory protective equipment.

An IDLH atmosphere is assumed in any of the following situations

- Structural firefighting;
- An untested confined space;

- An area where a known hazardous airborne contaminant is present at or above published IDLH concentrations;
- An area where a known hazardous contaminant is present at an unknown concentration;
- An area where a reduced oxygen concentration may produce a level of hypoxia that is IDLH; or
- An area where, in the opinion of a qualified person, the condition presents a potential IDLH atmosphere.

Additional resources for determining IDLH:

The CSA Standard, Z94.4 Selection, Use, and Care of Respirators, provides additional guidance for addressing potential IDLH situations involving oxygen deficiency.

Oxygen Concentration

Where the potential for an oxygen-deficient atmosphere exists, the oxygen concentration must be measured. Where the oxygen concentration is confirmed to be below 19.5%, the cause of the deficiency must be understood and ongoing monitoring performed, or the atmosphere must be assumed to be IDLH. Workers in an oxygen-deficient atmosphere require air-supplying respiratory protective equipment.

Toxic properties of the Contaminant(s)

Certain toxic properties of the contaminant will influence the choice of a respirator. For example,

choosing a full-face piece, rather than a half-mask respirator, is necessary for protection against contaminants that irritate the eye.

Physical form of the Contaminant:

The contaminant will be present as a dust, mist, fume, fiber, gas, or vapor (for example, silica dust, and asbestos fibers or hydrogen sulphide gas). Sometimes it is present in more than one form. Identify the following physical states for all contaminants as they are likely to be encountered:

- Gas or vapor, and/or
- Particulate.

Presence of Oil

To select the appropriate particulate filter using the NIOSH classification system, it is also necessary to determine whether or not oil is present in the workplace where the respirator will

be used (i.e. use of air compressor systems with oil lubricators, the operation of motor vehicles, the operation of equipment with combustion engines or any other operation that may generate airborne oil). If the presence of oil is unknown, it is assumed to be present. Monitoring is not required to make this judgment.

Need for Emergency Escape

A mouth-bit on a nose-clamp respirator may be used for emergency escape situations if it can provide protection against the contaminants present and the respirator is not being used in an oxygen-deficient atmosphere. Other types of respiratory protective equipment that can be proven to provide equal or greater protection may also be used.

Minimum Protection Factor Needed

The Assigned Protection Factor of the respirator type is identified in Table 1 & 2 and also outlines factors and limitations of respirators that must be considered during the selection process.

A respirator should never be used in an environment where the hazard ratio is greater than its assigned protection factor. In some cases, the assigned protection factor for the respirator will depend on the type of fit test that is done.

Engineering Controls

Are engineering controls being used in conjunction with the respiratory protection?
Some examples:

- Functioning fume hood;
- Mechanical ventilation;
- Adding clean air to oxygen-deficient space;
- Enclosure or isolation of the process or work equipment;
- Substitution with less hazardous materials etc.

Administrative Controls

Are administrative controls needed or being used in conjunction with the respiratory protection? Are written work procedures available? Some examples:

- Reduced work schedule;
- Appropriate training;
- Good work practices;
- Written procedures;

- Appropriate supervision etc.

Anticipated Respirator Use Time

Certain types of respirators are more effective for use over longer periods of time. When a respirator is anticipated to be worn for extended periods of time, it may become uncomfortable. Wearing an uncomfortable mask for a long period of time can become intolerable. Consideration should be given to administrative controls to minimize respirator use. Some examples:

- Less than 1 hour
- Between 1 hour and 6 hours
- Full shift 6 hours or more

Worker Activity Level

Respirator use can sometimes be quite physically demanding for the average worker. Respirators can impose several physiological stresses ranging from very mild restriction of breathing to burdens of great weight and effort. Increased physical activity and/or increased ambient temperature result in an increase of breathing rate. Consideration should be given to administrative controls to minimize breathing rates while using respiratory protection.

Some examples:

- Low (minimal movement / room temperatures)
- Medium (medium work activity / slightly higher room temperature)
- High (very strenuous activity / high heat load)

Work Area Location

Characteristics of the work area location, operation or process (high temperature, confined space, remote areas, etc.) must also be known to assist in the selection of respiratory protection.

Safe Area Location

Workers wearing respirators must know where a safe area with no airborne contaminants is located.

This safe area is the location for donning and removing respirators, as well as the assembly point for rescue, identified as part of the emergency response plan.

Respirator Selection

A respirator should never be used in an environment where the hazard ratio is greater than its assigned protection factor. To select the appropriate level of respiratory protective equipment, use the highest hazard ratio (HHR) of the individual components present (Table 1).

Hazard Ratio

A hazard ratio is the estimated/measured airborne concentration of a substance divided by the occupational exposure limit; this ratio is calculated for each gas, vapor, and/or particulate component that poses a respiratory hazard.

Once the airborne concentration of the contaminants that the worker may be exposed to is known, a hazard ratio (HR) can be calculated:

Hazard Ratio = Airborne Concentration/OEL

The highest hazard ratio (HHR) is the highest calculated hazard ratio (HR) for any gas, vapor, and/or particular component that poses a respiratory hazard.

TABLE 1 - USE OF HHR TO SELECT A RESPIRATOR

HHR	Minimum Level of Respirator Needed	
	Air Purifying	**Air Supplying**
≤ 10	Half face piece	Demand half face piece
≤ 25	Loose-fitting face piece PAPR	Loose-fitting face piece/visor
≤ 50	Half face piece PAPR	Positive pressure half face piece
≤ 100	Full face piece	Positive pressure full face piece or demand SCBA
≤ 1,000	Full face piece PAPR	Positive pressure full face piece
≤ 10,000	May not be used	Positive pressure SCBA or positive pressure air supply respirator with auxiliary air supply

PAPR = Powered Air Purifying Respirator; SCBA = Self-Contained Breathing Apparatus

The Respirator Selection Information Form is required prior to fit-testing and selection of appropriate respiratory protection.

RESPIRATOR TYPE REQUIRED

The information collected on the respirator selection form, following the Respirator Type Selection

Flowchart and assigned protection factors will identify the type(s) of respirator protection that will be appropriate.

RESPIRATOR FIT TESTING AND TRAINING

All tight-fitting half and full-face-piece respirators whether negative or positive pressure (respirator inlet covering that forms a complete seal with the face), must be fit tested. The worker must be fit tested with the same make, model, style, and size of respirator that will be used. The worker must be fit tested prior to the initial use of the respirator, whenever a different respirator face piece (size, style, model or make) is used, and at least annually thereafter.

All workers who require tight-fitting respirators for their work must be fit tested and trained in the safe use of the respirator by the Safety Dept. Workers must bring a written hazard assessment (Respirator
Selection Information Form) with them to the Respiratory Fit Testing and must also be clean shaven.
Workers will not be trained or fit-tested without the written hazard assessment or without being clean shaven.

Loose-fitting respirators (respirators that form a partial seal with the face, do not cover the neck and
shoulders, and may or may not offer head and/or eye protection) do not require fit testing. This includes: dust masks, loose fitting PAPR etc.

ADDITIONAL USE CONSIDERATIONS

Respirator selection must be carried out for both non-emergency and emergency use. The respirator selected in both instances may be the same, but respirators approved for “Escape-Only” must NOT be used for non-emergency applications.

Personnel conducting respirator selection should consider extraordinary circumstances in the operations that could adversely affect the function of a respirator (i.e. extreme cold or radiant heat, hypobaric or hyperbaric conditions etc.). Additional, advice should be sought from the manufacturers’ technical experts.

USE, CARE AND MAINTENANCE OF RESPIRATORY PROTECTION

Respiratory protective equipment works properly only when selected, used, maintained and cared for in the proper manner. Only approved respirators may be used. Follow the manufacturer’s specific instructions for use, care, and maintenance of respiratory protection equipment.

FIT-TESTING & TRAINING REQUIREMENTS

All workers who require respirators for their work must have training in a Respiratory Fit Testing and

Training by the Safety Department that incorporates the following:

- Hazards.
- Selection criteria.
- Purpose, proper use and limitations.
- Cleaning, maintenance and storage.
- Donning and removal.
- Fit testing and medical surveillance.
- Familiarization with the Code of Practice.

A fit-test may be qualitative or quantitative. A qualitative fit test (QLFT) is a pass/fail method that relies on the subject's sensory response to detect a challenge agent in order to assess the adequacy of respirator fit. A quantitative fit test (QNFT) is a test method that uses an instrument to assess the amount of leakage into the respirator in order to assess the adequacy of respirator fit. In some cases, the assigned protection factor for the respirator will depend on the type of fit-test that is conducted.

*Workers must bring a written hazard assessment (Respiratory Selection Information Form) with them to the Respiratory Fit Testing Course. Workers will not be trained or fit tested without the written hazard assessment.

*Workers must participate in refresher training in respiratory protection annually.

EMERGENCY RESPONSE PROCEDURE

*In the event of an incident, stop work, leave the area and contact the Safety Department and notify all occupants / workers in the area to evacuate. Close the door and restrict access until contaminant levels have been determined and problem has been controlled or abated.

See Asbestos Identified in Section 3 Item 1 in the Safety Manual

COMMUNICATIONS PLAN

General Communication: A variety of communication mediums will be used to heighten the awareness at our company of the Respiratory Protection Program.

SIGNAGE

Specific work areas (maintenance areas, laboratories, hazardous materials processing areas etc.) that are identified as containing high airborne hazard require external signage. The posted signage must minimally state the following:

- CAUTION
- Respiratory Protection Required.

WORKER HEALTH ASSESSMENT

As part of the respirator fit-testing, workers must complete a health surveillance questionnaire. This should be done before they are assigned to complete work in areas where respirators may be required.

The workers must be physically fit to carry out the work while wearing respiratory equipment and be comfortable about wearing respirators.

Workers with facial hair, like beards, long sideburns, or even a two-day stubble may not wear respirators because the hair breaks the seal between the skin and the respirator mask. Wearing eyeglasses may interfere with the respirator seal while wearing a full-face respirator. This means that the respirator mask will leak and not provide the needed respiratory protection. Also, if a worker has facial scars or an acne problem, the facial skin may not be able to form a good seal with a respirator mask.

DOCUMENTATION

The Safety Department must retain the current copy of the Respiratory Protection Program.

Supervisors must include the written hazard assessment and fit testing records by Safety Department as part of their worker's training record for a minimum of two years. The Safety Department will retain any worker health assessment and medical history information indefinitely.

A copy of the Respiratory Protection Program (including occupational exposure assessments) must be available to affected workers and government officers, on request.

PROGRAM REVIEW AND AUDIT

The goal of the program review is to continuously improve the Respiratory Protection Program. The

Safety Dept. will review the Respiratory Protection Program annually. The evaluation will include a review of the written program, training records, exposure assessments, safe work procedures, and health assessment program.

DEFINITIONS

Air-line Respirator: a supplied air respirator through which breathable air is delivered to the worker via an air line. Air is supplied from a compressor or compressed air cylinder.

Air-purifying Respirator: removes contaminants from workplace air by passing it through a filter, a cartridge, or a combination of both, to provide protection from combinations of particulates, vapors, or gases.

Air-supplying Respirator: a respirator that supplies the respirator user with breathing air/gas from a source independent of the ambient atmosphere.

Assigned Protection Factor (APF): the anticipated level of respiratory protection that would be provided by a properly functioning respirator or class or respirators to properly fitted and trained users.

Clean-shaven: a worker has no facial hair that will interfere with an effective seal between the worker's face and the respirator face piece. In practical terms, the skin under the respirator seal must have less than one day of facial hair growth.

Compressed Breathing Air: is supplied atmospheric air under pressure of a quality that complies with
CSA Standard Z180.1, Compressed Breathing Air and Systems, and does not contain a substance in a concentration greater than 10% of the applicable OEL.

Confined Space: means an enclosed or partially enclosed space that is not designed or intended for continuous human occupancy with a restricted means of entry or exit and may become hazardous to a worker entering it because of its design, construction, location or atmosphere; of the work activities, materials or substances in it; the provision of first aid, evacuation, rescue or other emergency response service is compromised; or of other hazards relating to it.

Fit Factor: a quantitative measure of the fit of a particular respirator to a particular individual.

Hazard: is a situation, condition, process, material or thing that may cause an injury or illness to a worker.

Hazard Ratio: is the estimated/measured airborne concentration of a substance divided by the occupational exposure limit; this ratio is calculated for each gas, vapor, and/or particulate component that poses a respiratory hazard.

Highest Hazard Ratio: is the highest calculated hazard ratio (HR) for any gas, vapor, and/or particular component that poses a respiratory hazard.

Immediately Dangerous to Life and Health (IDLH): means circumstances in which the atmosphere is deficient in oxygen or the concentration of a harmful substance in the atmosphere is an immediate threat to life; may affect health irreversibly; may have future adverse effects on health, or may interfere with a worker's ability to escape from a dangerous atmosphere.

Loose-Fitting Respirator: the face piece/visor of a respirator that forms a partial seal with the face, does not cover the neck and shoulders, and may or may not offer head and/or eye protection.

Occupational Exposure Limit: a maximum concentration of airborne contaminants deemed to be acceptable, as defined by Schedule 1 of the Alberta Occupational Health & safety Code.

Powered Air Purifying Respirator (PAPR): a full-face mask into which filtered air is pumped about 100-150 liters per minute (4-6 cubic feet per minute). The PAPR consists of a full-face mask, a battery pack, an air pump, high efficiency filter and hoses.

Qualitative Fit-Test (QLFT): a method of testing a respirator's face piece-to-face piece seal by injecting
an agent such as saccharin or Bitrex™ inside a test chamber (enclosure hood) and subjectively determining whether the wearer detects the agent.

Quantitative Fit-Test (QNFT): a method of testing a respirator's face piece-to-face piece seal using instrumentation that quantifies the actual protection factor provided by the respirator.

Respirator: personal protective equipment that protects a worker against the inhalation of airborne contaminants providing it is the correct type of respirator and is worn properly.

SCBA (Self Contained Breathing Apparatus): a respirator that provides breathing air from a compressed air cylinder, usually located on the wearer's back.

Supervisor: means the individual that directs or oversees a person, group, department, organization, or operation for our company.

Tight-Fitting Respirator: a face piece inlet of a respirator that forms a complete seal with the face. This includes a half-face piece that covers the user's nose and mouth under the chin; and a full-face piece that covers the user's nose, eyes, and mouth under the chin.

User Seal Check: a fit check of a respirator by the wearer, prior to use, to ensure that the respirator is positioned correctly and providing an effective seal. The field check is conducted according to the manufacturer's instructions before each use.

Worker: any person engaged in work at or for our company, including employees, contracted workers, volunteers, and graduate students.

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