

RESPIRATORY PROTECTION

Program Guideline



Implementing respiratory protection best practices.

WorkplaceNL

Health | Safety | Compensation

1.0 Disclaimer/References

This guide is based on Occupational Health and Safety Regulations s. 83 to 85 and Canadian Standards Association (CSA) standards Z94.4-18 (Selection, use and care of respirators) and Z180.1-19 (Compressed breathing air and systems).

The CSA standards are not covered in their entirety, users of this guide must consult the standards for circumstances that are not addressed in this guide.

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2.0 Introduction

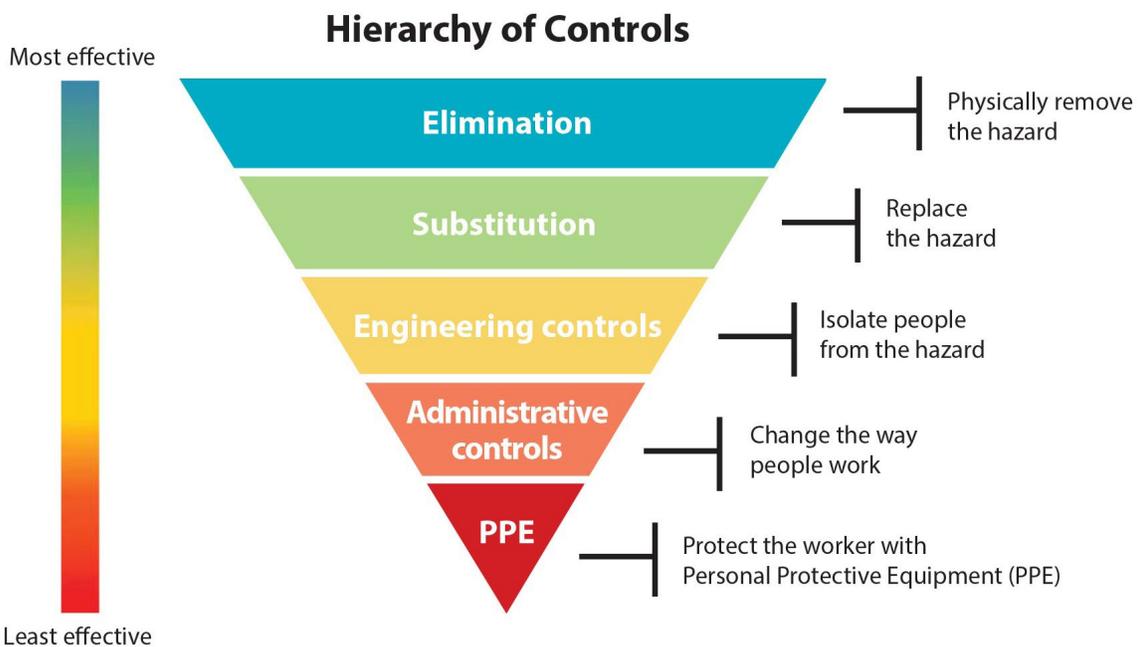
RPP

A Respiratory Protection Program (RPP) sets the minimum requirements for the selection, use, and care of respiratory protection. An RPP helps to keep exposure to airborne hazards within acceptable levels and protect employees from developing an occupational illness or disease as a result of overexposure.

Best Practice

An RPP must state the purpose of the program and include:

- Roles and responsibilities.
- Risk assessment process.
- Respirator selection process.
- Health surveillance, screening, training and fit-testing.
- Inspection, cleaning, maintenance, storage and use of respirators.
- Record keeping.
- Program evaluation.



3.0 Roles and Responsibilities

Roles and responsibilities of an RPP establish effective communication between various groups and the integration of an RPP into an existing Occupational Health and Safety (OHS) program.

3.1 Employer responsibilities

The employer is responsible to identify respiratory hazards, evaluate their risk and put controls in place. Where hazards exist, engineering and administrative controls are used, if practical, to eliminate or reduce exposure. Respiratory protection must only be used where these controls are not practical or able to keep hazard(s) within acceptable levels, as a short-term measure before controls are implemented, or during emergency situations.

Where respiratory protection is used to protect workers from inhaling a hazardous atmosphere or a low oxygen environment, the employer must:

- Develop, implement and maintain a written RPP in consultation with respirator users, which complies with Canadian Standards Association (CSA) standards.
- Select appropriate respiratory protection based on the hazard(s) present, user factors that affect performance and reliability, and in accordance with CSA standards.
- Take immediate precautions to protect workers from immediate danger if the exposure to a respiratory hazard cannot be identified or evaluated.
- Make sure respiratory protection is certified by the National Institute for Occupational Safety and Health (NIOSH) and is compatible with other personal protective equipment (PPE) and safety devices, so that one item does not make another ineffective.
- Make sure respiratory protection is not used if it could be hazardous to the user.
- Make sure respiratory protection is properly fitted and used correctly. Workers using tight-fitting respirators must perform a user seal check before each use.
- Train respiratory protection users in how to properly inspect, clean, maintain, store, and use assigned respirators, and the limitations of those respirators.
- Make sure respiratory protection is inspected before each use and after cleaning. Respiratory protection must be removed from service if an inspection reveals damage.
- Make sure workers keep respiratory protection sanitary by cleaning and disinfecting, as often as is necessary, and between users.
- Make sure emergency respiratory protection is inspected at least once a month, following the manufacturer's instructions and checked by the user before and after each use.
- Make sure respiratory protection that is used for emergency escape-only is inspected before it is brought into the workplace for use.
- Post signs stating the hazard and the required respiratory protection on entrance to an area that requires people entering it to wear respiratory protection.
- Make sure workers use supplied-air respiratory protection, when they could be exposed to an airborne hazard that is generated by a spray operation involving a sensitizing agent. Activities include application of a spray paint or similar coating, fibre-reinforced resin, thermoplastic material, expandable resin form, or similar materials.



- Make sure workers use respiratory protection during welding, burning and cutting operations, when ventilation is not sufficient to keep contaminants below the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs).
- Make sure workers with facial hair or another condition that may disrupt the respirator seal (i.e., where the respirator facepiece touches the face) are not permitted to use tight-fitting respirators. Acceptable and unacceptable facial hair is established in CSA standard Z94.4 (Selection, use and care of respirators).
- Ensure that workers with facial hair that may disrupt the seal of respiratory protection equipment, will not be permitted to use tight fitting respirators.
- Make sure compressed air, compressed oxygen and liquid oxygen used for supplied-air respiratory protection comply with CSA standard Z180.1 (Compressed breathing air and systems).
- Make sure compressed oxygen is not used in a supplied-air respirator that has previously used compressed air.
- Make sure an adequate number of trained rescue workers are immediately available whenever workers are in areas that have hazardous levels of contaminants or low oxygen levels. Rescue workers must have immediate access to appropriate respiratory protection and any other equipment or devices needed to perform rescue. They must also be trained to perform rescue.

3.2 Program administrator responsibilities

The program administrator is responsible for managing the RPP, assuming overall responsibility for its implementation and maintenance. This includes correcting deficiencies, enforcing compliance, and advising management when a change or resource is required. The name or position of the program administrator must be listed in the RPP.

The program administrator must:

- Ensure those assigned to roles in the RPP are qualified, including those responsible for evaluating respiratory hazards. This must include developing and maintaining a monitoring system and performance measures to assess and document the competency of persons assigned roles in the RPP.
- Develop and maintain a list of respirators selected for use in the workplace, including the make and model of the respirator, the required filtering elements (if applicable), and the hazard(s) they have been selected for protection against.
- Develop and maintain procedures for health surveillance, fit-testing, training, and the supply of respirators to users.
- Develop and maintain procedures for respirator use, cleaning, sanitization, inspection, use, maintenance, repair, and storage.
- Ensure respirator users successfully complete health surveillance (e.g., user screening or medical assessment), fit-testing, and training prior to the initial use of a respirator.
 - The user must be able to demonstrate ongoing competency in respirator use and receive additional training, where required.
 - Fit-testing must be repeated at designated intervals, no greater than two years apart, and when a change in the user may affect respirator fit.



- Develop and maintain emergency response and rescue procedures which address the following:
 - The consequences of equipment or power failures, uncontrolled chemical reactions, fire, explosion, or human error.
 - An analysis of respirator uses that might occur during emergency or rescue operations.
 - Consideration of past occurrences requiring emergency or rescue uses of respirators.
 - Rescue in environments which are Immediately Dangerous to Life and Health (IDLH) of respirator users.
 - The appropriate types and numbers of respirators that must be maintained and stored, so that they are readily accessible and operational when needed for emergencies or rescue.
 - If the emergency involves suspected or known terrorism, reference the standard CSA Z1610 (Protection of first responders from chemical, biological, radiological, and nuclear events).
- Consult with appropriate authorities, standards organizations or respiratory protection manufacturers when interpreting criteria affecting the use of respirators in the workplace.
- Monitor the use of respirators, including that they are being used, worn properly and are maintained in good working condition.
- Document problems, corrective actions, maintenance and repair.
- Review the RRP annually to assess its effectiveness and ensure the program is updated to maintain consistency with regulatory criteria, consensus standards, feedback from program evaluations, investigation reports, user comments, and product alerts that can affect the respirators used in the workplace. This review must be documented.
- Maintain records required by this program.

3.3 Supervisor responsibilities

Supervisors must make all reasonable efforts to protect the health and safety of workers under their supervision. This includes advising them of present and potential workplace hazards, and providing written or oral instructions on safety precautions that must be followed.

Supervisors must:

- Ensure workers use required respiratory protection.
- Ensure workers have successfully completed health surveillance (e.g., user screening or medical assessment), fit-testing and training, prior to assigning them to a task that requires respiratory protection.
- Ensure respiratory protection users demonstrate competency in the use of the respirators.
- Ensure respiratory protection users clean, sanitize, inspect, use, maintain, repair, and store respiratory protection in accordance with the company's written instructions, training and the manufacturer's instructions.

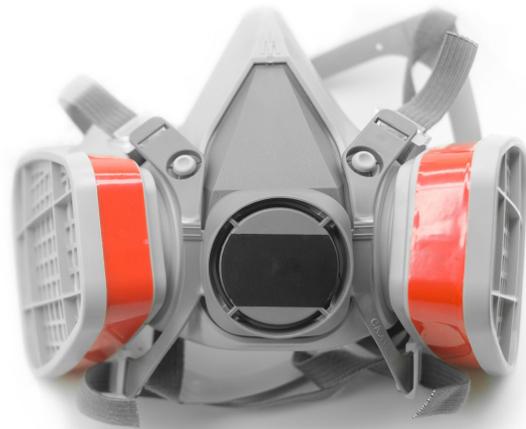
- Ensure tight-fitting respiratory protection users maintain a respirator seal (i.e., where the respirator facepiece touches the user face) free from interference from objects or materials, such as facial hair.
- Provide details of the type of respirator selected and the anticipated working conditions to a healthcare professional performing a medical assessment of a respirator user, where required.
- Notify the program administrator of respirator user concerns, changes in processes, equipment, operating procedures, or the environment that have an impact on respiratory protection requirements.
- Notify the program administrator of investigation reports that indicate that the use of a respirator could have prevented or contributed to an incident.

3.4. Worker responsibilities

Workers must take reasonable care to protect their health and safety and that of other persons at the workplace, including using respiratory protection when required.

Workers using respiratory protection must:

- Follow the company's written procedures, training and the manufacturer's instructions.
- Inspect, clean and sanitize the respirator prior to each use and at appropriate intervals to ensure that it continues to operate effectively. A respirator that is defective must be removed from service and reported to their supervisor.
- Perform user seal checks after each donning of a tight-fitting respirator.
- Ensure the respirator seal (i.e., where the respirator facepiece touches the user face) for a tight-fitting respirator is free from interference from objects or materials, such as facial hair.
- Report concerns and hazards to their supervisor, including conditions that could impact their ability to safely use the selected respirator



3.5. Fit test technician responsibilities

The fit tester is responsible for fit-testing respiratory protection users. The fit tester must be competent in fit-testing methodology and able to manage the overall fit testing process, including the interpretation of results.

They must:

- Follow the company procedures, training and reference the standard CSAZ94.4 (Selection, use and care of respirators) when performing fit testing and related duties.
- Not fit test a tight-fitting respirator if the seal (i.e., where the respirator facepiece touches the user face) is obstructed by objects or materials, such as facial hair.
- Verify that the user has successfully completed health surveillance (e.g., user screening or medical assessment), fit testing and training prior to beginning the fit test.
- Verify that the user is competent in respirator inspection, donning, doffing, and completing user seal checks (if applicable) by having the user demonstrate these tasks before completing the fit test.
- Document user competency and corresponding fit test results, and provide both the user and program administrator with a copy of these results.
- Clean and sanitize fit testing equipment between users.

- Calibrate and maintain quantitative fit test equipment in accordance with the manufacturer's instructions, if applicable.
- Notify the program administrator of respirator user concerns which arise during fit testing.

3.6. Respirator issuer responsibilities

Respirator issuers must follow the company's written procedures for providing respiratory protection to users. This must include confirming the user holds a valid fit test and only issuing the make and model of respirator for which the user has been fit-tested.

3.7. Respirator maintenance personnel

Respirator maintenance personnel must inspect, maintain, repair, and test respiratory protection in accordance with the manufacturer's instructions. They must also ensure that respiratory protection maintenance and repairs are documented and that a copy of this documentation is provided to the program administrator.

3.8. Healthcare professional responsibilities

Healthcare professionals performing medical assessments of respiratory users must assess the suitability of the user to safely use the selected respirator. They must:

- Have knowledge of the health effects associated with the respiratory hazards to which the user might be exposed.
- Have knowledge of the physiological and psychological stresses associated with use of the selected respirator under the anticipated working conditions.
- Report in writing whether or not a potential respiratory protection user meets medical requirements. If the user meets medical requirements with limitations, these limitations must be clearly defined in the report provided.

3.9. Contractor responsibilities

Contractors using respiratory protection must comply with OHS legislation, including the development and implementation of an RPP and associated procedures.

They must notify their contract manager of incidents where the use of a respirator could have prevented or contributed to an incident. The contract manager must provide a copy of these notifications to the program administrator.

4.0 Hazard Assessment

Employers must ensure that the workplace is assessed to identify hazards that require respiratory protection and to assist in the selection of appropriate protection. Exposure assessments must be repeated where there is a change to the airborne hazard or occupational exposure limits, and in accordance with the re-assessment schedule detailed in the RPP.

Records of exposure assessments (i.e., air sampling) must be retained by the program administrator.

4.1. Identification of hazards

The identification of respiratory hazards must include supplier and workplace safety data sheets (SDS), hazardous building materials, naturally occurring hazardous materials and hazards that arise from a work task or process.

4.2. Physical states of hazards

Where air-purifying respirator protection is selected, the physical state (particulate, gas or vapour) of the respiratory hazard determines the appropriate filtering media. Filters remove particulates (e.g., mists, dusts, fumes, fibres, and bio aerosols), while cartridges and canisters remove certain gases and vapours.

4.3. Oily atmospheres

Where air-purifying respirator protection is selected, the presence or absence of oil in the atmosphere determines the particulate filter series (N, R or P Series) required. The filter series also affects the filter change-out schedule.

See section 5.1.2. Filters, for detailed information

4.4. Oxygen deficiency or enrichment

The OHS Regulations, s. 12(a) requires that oxygen levels are maintained between 20 and 22 per cent by volume. Where a worker must enter an environment where oxygen is less than 20 per cent, supplied-air respirators combined with escape-only respirators must be used. Air-purifying respirators must not be used.

4.5. IDLH atmospheres

Immediately dangerous to life or health concentrations represent a level of exposure likely to cause death, immediate or delayed permanent adverse health effects, or impede a worker's ability to escape from an environment. IDLH concentrations are determined by the National Institute for Occupational Safety and Health (NIOSH).

An IDLH atmosphere must be assumed in any of the following situations such as:

- Structural firefighting;
- A confined space which has not had atmospheric testing;
- An area where a known hazardous contaminant is present at an unknown concentration;
- An area where a known hazardous contaminant is present at or above the IDLH concentration;
- An area where the oxygen concentration is below 20 per cent by volume; and
- An area where, in the opinion of a qualified person, a condition presents a potential IDLH atmosphere.

4.6. Airborne concentration

When a respiratory hazard exists, the airborne concentration of the hazard must be measured (e.g., air sampling) or estimated (e.g., mathematical modeling) by a qualified person in order to determine the appropriate level of respiratory protection needed (i.e. assigned protection factor) and to calculate the change-out schedule for air-purifying respirator filtering elements (i.e., filters, cartridges or canisters), if applicable.



The person performing the assessment must make sure that sampling or mathematical modeling is performed in accordance with recognized industrial hygiene practices (e.g., NIOSH, OSHA, etc.). They must also ensure that laboratory samples are sent to an AIHA-LP certified laboratory for analysis, if applicable.

Recommendations arising from an assessment must account for variation in processes, operations and environmental conditions.

4.7. Occupational exposure limits

Employers must ensure that a worker's exposure to a hazardous substance is kept as low as is reasonably practicable. Where a threshold limit value has been established by the American Conference of Governmental Industrial Hygienists (ACGIH), exposure must not exceed the threshold limit value (TLV).

The TLV refers to airborne concentrations of a substance which is believed that nearly all workers may be repeatedly exposed, day after day, over a working lifetime, without experiencing adverse health effects.

ACGIH TLVs include:

- TLV-TWA (Threshold Limit Value-Time Weighted Average).
 - The average allowable exposure on the basis of an 8-hour day, 40-hour week work schedule. This TLV-TWA must be adjusted for unusual work shifts (e.g., shifts other than an 8-hour day, 40-hour week), in accordance with the ACGIH.



- TLV-STEL (Threshold Limit Value-Short Term Exposure Limit).
 - A 15-minute exposure that cannot be repeated more than four times per day, with at least a 60-minute break between each exposure period.
 - Where a TLV-STEL has not been established by the ACGIH, exposure must not exceed three times the TLV-TWA, for more than a total of 30 minutes during the shift.
- TLV-C (Threshold Limit Value-Ceiling Limit).
 - The absolute exposure limit that must not be exceeded at any time.
 - Where a TLV-C has not been established by the ACGIH, exposure must not exceed five times the TLV-TWA.

Where ACGIH TLVs do not exist for a hazard, other established occupational exposure limits can be used, such as:

- American Industrial Hygiene Association (AIHA), Workplace Environmental Exposure Levels (WEELs);
- National Institute for Occupational Safety and Health (NIOSH), Recommended Exposure Limits (RELs); and
- Occupational Safety and Health Administration (OSHA), Permissible Exposure Limits (PELs).

4.8. Substance-specific standards

Provincial substance-specific standards must be considered during the hazard assessment.

These include, but are not limited to:

- OHS Regulations, s. 46 and 47 (Silica)
- OHS Regulations, s. 49 (Lead)
- OHS Regulations, s. 69 (Painting, Coating and Working with Plastics or Resins)
- OHS Regulations, s. 48 (Asbestos)
- Asbestos Abatement Regulations

4.9. Skin absorption and eye irritation

If an airborne hazard can be absorbed through the skin or eyes, the assessor must recognize that respiratory protection may not be sufficient to protect workers from exposure. In these cases, they must consider the limited skin and eye protection offered by some types of respirators (e.g., hoods, helmets and full-facepieces). The use of biological exposure indices (e.g., blood, urine, breath) accounting for exposure from absorption and ingestion must be considered.

4.10. Communication

Program administrators must inform workers of the results of assessments and control plans. Results must also be shared with management, the OHS Committee or Worker Health and Safety Representative.

5.0 Respiratory Selection

Only NIOSH-approved respirators are permitted to be used to protect workers.

Respirator selection must be based on a review of the exposure assessment (e.g., air sampling) or estimation of exposure (e.g., mathematical modeling), legislative standards, manufacturer's instructions, safety data sheet(s), and professional judgment.

Those performing respirator selection must consider the limitations of the respirator and extraordinary circumstances related to the process or operation that could adversely affect the function of the respirator (e.g., extreme temperatures or pressure).

The selection process must be repeated when there is a change to the airborne hazard or occupational exposure limits, and in accordance with the re-assessment schedule detailed in the RPP. Records of the selection process must be retained by the program administrator.

Please see Appendix 2 - Respirator Selection Flow Chart

5.1. Air-purifying respirators

Air-purifying respirators (APRs) remove contaminants by passing air through a filtering medium. They may be powered or non-powered, disposable or reusable, and tight-fitting or loose-fitting.

APRs are not for use in the following situations:

- Unknown atmospheres.
- Oxygen deficient or enriched atmospheres.
- IDLH atmospheres.
- Airborne concentrations above the occupational exposure limit (i.e., ACGIH TLVs) and the assigned protection factor of the respirator selected.
- If there is an interference concern with the respirator seal, such as facial hair.

5.1.1. Assigned protection factor

The assigned protection factor (APF) is a value assigned by CSA Z94.4 (Selection, use and care of respirator) which indicates the level of protection granted by the type of respirator. A respirator must not be used for protection against concentrations of an air contaminant greater than the APF. For example, a respirator with an APF of ten protects workers up to ten times the TLV-TWA. If the exposure assessment determines that exposure is greater than ten times the limit, a respirator with a higher APF must be selected.

Please see Appendix 3 - Assigned Protection Factors of Respirators

5.1.2. Filters

Filters remove particulates (e.g., dusts, mists, fumes, fibres and bioaerosols) from the air by passing it through a woven material with an electrostatic charge. The color-code for filters is magenta (pink-purple); however, the facepiece of disposable respirators may vary.

Filter efficiency describes how well the filter can remove particulates from the air. There are three possible filter efficiency classes:

- Class 95 is 95 per cent efficient at removing particulates from the air.
- Class 99 is 99 per cent efficient at removing particulates from the air.
- Class 100 is 99.97 per cent efficient at removing particulates from the air.



The filter series determines whether the filter can be used in an atmosphere containing oils. There are three possible levels of oil resistance:

- N Series filters are not oil resistant. These filters must not be used in an atmosphere containing oils.
- R Series filters are oil resistant. These filters have limited use in an atmosphere containing oils.
- P Series filters are oil proof. These are the preferred option when working in an atmosphere containing oils.

5.1.3. Cartridges and Canisters

Cartridges and canisters remove certain gases and vapours from the atmosphere by passing the air through a sorbent material such as activated charcoal. They do not provide protection from particulates.

Cartridges and canisters are color-coded depending on the gases and vapours they remove. Cartridges and canisters do not exist for all gas and vapour hazards. In these cases, supplied-air respirators must be used.

5.1.4. Change-out schedules

When an air-purifying respirator is selected, the worker must be provided with a schedule for the replacement of the filters, cartridges or canisters. This change-out schedule must be calculated by a qualified person and consider the following:

- The contaminant's chemical properties, physical state, and airborne concentration.
- Environmental factors including, temperature, humidity, and atmospheric pressure.
- The characteristics of the air-purifying element (e.g., filter, cartridge or canister).
- The effectiveness of the air-purifying element against the hazard(s).
- The breathing rate and volume of the respirator user.
- The pattern of use (e.g., continuous or intermittent).

Exposure assessments must be performed for groups of users with similar exposure (i.e., similar exposure groups). Expert opinion, manufacturer's instructions and rules of thumb resulting from experimental work by scientific organizations (e.g., AIHA, NIOSH, etc.) may be used when it is not feasible to assess similar exposure groups.

A worker must never rely on warning properties, such as odor, taste, respiratory irritation, or eye irritation to indicate that filtering element must be replaced. Workers who notice warning properties before the end of the change-out schedule must immediately leave the work area and report the symptoms to their supervisor. The supervisor must then notify the program administrator, as warning properties may be an indicator that the respirator change-out schedule must be re-evaluated.

Filters

Filters must be replaced when they are damaged, wet, soiled, unhygienic, if there is breathing resistance, and in accordance with the company's change-out schedule.

Filters used in powered air-purifying respirators must also be replaced when the air flow does not meet the manufacturer's requirements.

The following additional rules apply filters used in an oily atmosphere:

- N Series filters must not be used as protection in an oily atmosphere.
- R Series filters must be replaced after 8 hours of use or after the respirator has been exposed to 200 milligrams (mg) of the contaminant, if used in an oily atmosphere. R Series filters must not be used for more than 8 hours unless a change-out schedule is calculated by a qualified person based on representative airborne particulate concentrations and estimated breathing rate.
- P Series filters must be changed every 40 hours or 30 days, whichever comes first, when used in oily atmospheres.

Cartridges and canisters

Cartridges and canisters must be replaced when they are damaged, wet, soiled, unhygienic, if there is a noticeable increase in breathing resistance, if the expiry has elapsed, and in accordance with the company's change-out schedule. They must also be replaced if the End-Of-Service-Life Indicator (ESLI) activates.

The expiry of cartridges and canisters is established by the manufacture. In some cases, the user must note the service date and time on the cartridge or canister in order to determine the expiry. For example, a cartridge may expire six months from the date they are removed from their package, regardless of use. These cartridges and canisters require the user to record the service date and time in a specific location on the body of the cartridge.

Combination filters, cartridges and canisters

The change-out schedule for non-separable combination filter-cartridges must be based on the lesser service time for either the filter or cartridge constituent.

Note: Some particulate filters and disposable particulate respirators contain small amounts of carbon for relief from nuisance odors. These filters must not be used when the concentration of the contaminant exceeds the exposure limit; therefore, no additional change-out parameters are necessary.

5.2. Supplied-air respirators

Supplied-air respirators (SARs) provide breathing air to the user from an external source (e.g., compressed gas cylinder or compressor). The breathing air is then transferred by an airline to a facepiece, hood, helmet, or suit.

SARs can be divided into four categories:

- Self-contained breathing apparatus (SCBA), including pressure-demand, open and closed circuit.
- Airline SARs, including pressure-demand and continuous-flow.
- Multi-functional.
- Escape-only respirators.

SAR selection must consider that:

- Atmospheric pressure, temperature and the degree of physical activity will affect the function of the respirator.



- A self-contained breathing apparatus (SCBA) contains a limited amount of compressed breathing air. The cylinders of an SCBA can restrict access and egress to confined spaces, and the worker will need to carry additional weight.
- Airline SAR use is restricted by the length of the airline, and multiple users will need to organize their airlines to prevent entanglement.

- Airline SARs used in an IDLH atmosphere must be combined with an escape-only respirator.
- An SAR escape-only respirator must not be used to enter a hazardous atmosphere; they are for emergency escape only. Precautions must be taken to make sure that a respirator used for escape is a type appropriate for the conditions and duration of use.
- Escape-only respirators do not have alarms to warn the user of depletion of the air supply.
- Breathing air cylinders for SCBA and SAR escape-only respirators have a shelf life.
- Buddy breathing (i.e., sharing an air supply) is prohibited. Buddy breathing compromises the integrity of the users SCBA by either removing the facepiece or disconnecting the breathing tube. These actions place the rescuer in grave danger.

6.0 Inspection, Use, Care, Maintenance, and Storage of Respirators

When engineering or administrative controls cannot eliminate or reduce respiratory hazards below occupational exposure limit(s), respiratory protection must be provided. Respiratory protection must be inspected before use and replaced if needed. It should also be cleaned, maintained and stored according to manufacturer's instructions.

6.1. Respirator interference concerns

Fit testing must be performed free from interference from personal accessories and hair where the respirator seals to the skin. Individuals who are unwilling or otherwise unable to comply with these interference-free requirements, or who are unable to obtain an acceptable fit must be prohibited from using a tight-fitting respirator.

6.2. Communication concerns

The respirator seal (i.e. where the respirator facepiece touches the face) must not be broken so that workers can communicate with each other. Where communication is not optimal the use of electronic speech transmission devices must be used.

Respirators used in a flammable atmosphere that requires intrinsic safety must be equipped with electronic speech transmission devices that have an electrical power. Intrinsically safe equipment is designed to limit energy within a device that could be a source of ignition, (e.g., hearing protection that combines with two-way radio communication).

6.3. Extreme temperatures and humidity

Respirators used in extreme temperatures and high humidity can undergo adverse functional changes that affect performance and the safety of the user. The manufacturer's instruction must be consulted for limitations and users must be trained in procedures to reduce the risk of equipment failure, including the strict adherence to maintenance and repair schedules and procedures.

6.4. IDLH atmospheres

Respirators must only be used in an IDLH atmosphere during an emergency by qualified personnel (e.g., emergency response and rescue professionals).

Workers entering an IDLH atmosphere during an emergency must use pressure-demand SCBA's, multi-functional SCBA's or multi-functional SAR's. These respirators must be combined with an escape-only respirator with a minimum service time of 15 minutes. Where a multi-functional SCBA or SAR is used, no more than 20 per cent of the auxiliary air must be used before connection is made to an airline.

Workers engaged in structure firefighting must use pressure demand SCBAs with a service time of 30 minutes or greater.

6.5. Inspection

Respirators must be inspected by the user before each use in accordance with the manufacturer's instructions. The inspection must include:

- Condition of component parts (e.g., facepiece, helmet, head harness, harness assemblies, valves, connecting tubes, cylinders)
- Tightness of connections
- End-of-service-life indicator (ESLI) and shelf life dates
- Function of pressure gauges, regulators, alarms, and other warning systems

Respirators maintained for emergency use must be inspected at a frequency to ensure it will function properly when required. The National Fire Protection Agency (NFPA) recommends weekly inspections for respirators maintained for emergency use. The National Institute for Occupational Safety and Health (NIOSH) recommends inspecting SCBA cylinder pressure at least weekly.



Each respirator must be properly maintained to retain its original effectiveness. Defective or non-functioning respirators must be removed from service and tagged for repair by authorized personnel, if applicable.

6.6. Cleaning and sanitizing

Respirators must be cleaned and sanitized according to respiratory manufacturer's instructions prior to and after each use. Heavy-duty cleaning products and lanoline are not recommended for cleaning respirators as these chemical cleaners may degrade the elastomeric facepiece.

6.7. Storage

Respirators must be stored properly to protect them against deformation, dust, ozone, sunlight, extreme heat or cold, excessive moisture, vermin, damaging chemicals, oils, greases, and any other hazard or conditions that could have a detrimental effect on the respirator.

6.8. Recordkeeping

Records of inspection, maintenance and storage of respirators must be retained by the program administrator in accordance with the manufacturer's instructions.

7.0 Health Surveillance

Prior to fit testing and respirator use, the user must complete health surveillance consisting of either successful completion of a medical screening form or a medical assessment. This confirms that users are free from a physiological or psychological condition(s) that could preclude them from safely using the selected respirator.

Where a medical screening form or medical assessment indicates that a concern exists, a written opinion from a healthcare professional must be obtained regarding that person's ability to use the selected respirator. Additional written opinions may be required if a change in the user's condition.

The program administrator must establish procedures to provide healthcare providers with job information necessary to provide a written opinion, including the work activity, the workplace environment, and the type of respirators required.

The written opinion must indicate whether the user:



- Meets medical requirements
- Meets medical requirements with limitations
- Does not meet medical requirements to use the selected respirator

Where limitations are imposed, these must be explicitly stated in the written opinion.

Records of medical screening forms and medical opinions must be retained by the program administrator. Health information including the result of medical assessments must be treated as confidential and be controlled and maintained by the Healthcare professional.

Please see Appendix 4 - Respirator User Screening Form

8.0 Training

Program administrators must ensure that those assigned to roles in this RPP are trained to perform their responsibilities and that records are kept for the duration of their employment.

Respirator training must include:

- A general overview of the RPP roles and responsibilities
- The type(s) of respiratory protection selected for work, including:
 - The hazard(s) they have been selected for protection against
 - The required filtering elements and change-out schedule, if applicable
 - Any limitations of the respirator

- The operation of the respirator selected, including:
 - Properly putting on and removing respirators
 - User seal checks
 - Inspection, use, care, cleaning, maintenance, and storage
 - ESLI recognition
 - Change-out schedules
 - Use under equipment failure or emergency conditions
 - Removal from service
 - Respiratory interferences concerns (e.g., facial hair)
 - The manufacturer's instructions

9.0 Fit-testing

Fit-testing must be performed for all tight-fitting respirators prior to initial use. A fit-test is used to assess whether a specific make, model and size of respirator is adequate to protect a specific user. If a fit-test is not performed, an unsatisfactory seal may unknowingly exist that could allow leakage of airborne hazards.

Additional fit testing is required every two years at minimum and when:

- Changes to a user's physical condition could affect the respirator fit (e.g., significant weight change, changes to facial or dental features, etc.).
- There is a change in personal protective equipment worn by the user that could affect the fit.
- There is a change in the respirator make, model or size.
- A respirator user experiences discomfort or difficulty completing user seal checks while using a selected respirator.

A fit-test must only be carried out after successful completion of health surveillance and respiratory protection training. It must not be performed if the user has a condition that could disrupt the respiratory seal, such as facial hair.

The fit-test process must follow the procedures outlined in CSA Z94.4 (Selection, use and care of respirators).

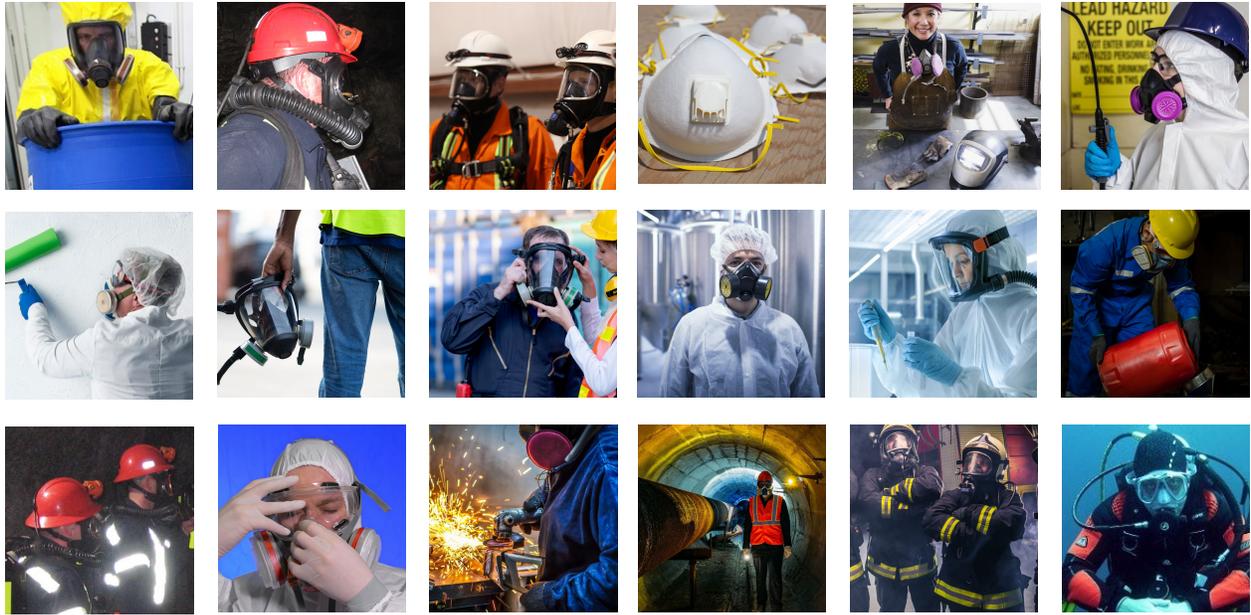
The program administrator must make sure that procedures are established to make sure that fit test records are effectively managed and maintained for a minimum of five years. Where a quantitative fit-testing device is used, records of calibration and repair must be retained by the program administrator in accordance with the manufacturer's instructions.



Fit-test records must include the following:

- The name or identification of the employee tested.
- The type of fit test performed (e.g., qualitative or quantitative).
- The make, model, and size of the respirator fitted.
- The date of the fit test.
- The name of the fit test technician.
- Documentation of the individual user's competency and corresponding fit test results.
- The proper cleaning and sanitizing of respirators and fit testing equipment.
- Documentation of the maintenance, calibration, and repair of fit test equipment.

Please see Appendix 5 - Respirator Fit-test form



10.0 Recordkeeping

RPP records must include:

- The individuals fulfilling roles and responsibilities in the RPP.
- Respiratory hazard exposure assessment.
- Respiratory protection selection process.
- Health surveillance.
- Training records.
- Fit-testing records.
- Maintenance and calibration records for respiratory protection and fit testing equipment, if applicable.
- Program evaluation.

Records must be maintained by the program administrator for the duration of employment or 10 years.



11.0 Program Evaluation

An RPP must be evaluated annually, and if there is a change to legislation, CSA standards or occupational exposure limits.

Refer to Appendix 6 for a Program Evaluation Checklist

12.0 Appendix 1 – Definitions

Administrative Controls - A method of controlling hazards, which involves a change in behavior (e.g., establishing programs, policies, procedures, training, etc.)

Air-Purifying Respirator - A respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

ACGIH - American Conference of Governmental Industrial Hygienists is a scientific organization that develops occupational exposure limits for chemical and physical hazards. These limits can be found in their TLVs® and BEIs®.

AIHA - American Industrial Hygiene Association is the association for scientists and professionals committed to preserving and ensuring occupational and environmental health and safety in the workplace and community. AIHA serves as a resource for those employed across the public and private sectors and the communities in which they work.

Asphyxiant - A gas that has the ability to cause suffocation in an enclosed workspace by displacing breathable air.

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

Biological Exposure Indices (BEI) - Analysis of exhaled air, a biological fluid (e.g., urine or blood), or a body tissue to assess the extent of exposure.

Breakthrough - The penetration of a contaminant through an air-purifying cartridge or cannister when the cartridge or cannister is saturated with the contaminant.

Breathing Air - Includes oxygen, air, or other respirable gas as defined by the relevant standards.

Breathing Zone - The breathing zone is the area immediately surrounding a worker's nose and mouth where the majority of air is drawn into their lungs. This zone is the area monitored during an industrial hygiene survey to aide in determining the presence of airborne contaminants.

Buddy Breathing - The use of an accessory device on a SCBA, or a practice that enables a second person to simultaneously share the same breathing air supply as that of the user.

Cartridges and Canisters - Remove certain gases and vapours from the atmosphere by passing the air through a treated charcoal medium. Cartridges are color-coded depending on the gases and vapours they remove. Cartridges do not presently exist for all gases and vapours.

Change-Out Schedule - The selection of air-purifying respirators must include a change-out schedule calculated by a qualified person. This time period for change-out must be established

Compressed Breathing Air - Normal air processed by a compressed breathing air system and that meets the purity requirements of CSA Z180.1 (Compressed breathing air and systems).

Compressed Breathing Air System - An assembly of components (e.g., air intake, ambient air system, purification system, compressor, receiver, piping, fittings, cylinder, proportioning system, compressed breathing air pipeline, control equipment etc.) required to produce or deliver compressed breathing air.

Compressor - An air-moving device used to raise the pressure of gases above standard atmospheric pressure.

Contaminant - A material foreign to normal air or that is found in normal air, but has known toxic properties, or found in normal air and normally considered to be non-toxic, but may affect the operation of a respirator or compressed breathing system, or present another hazard to the user.

Canadian Standards Association (CSA) - The CSA Group (formerly the Canadian Standards Association; CSA) is a standards organization which develops standards in 57 areas. CSA publishes standards in print and electronic form, and provides training and advisory services. CSA is composed of representatives from industry, government, and consumer groups.

Cylinder - Pressure vessel as defined in CSA B339 (Cylinders, spheres, and tubes for the transportation of dangerous goods) and B340 (Selection and use of cylinders, spheres, tubes, and other containers for the transportation of dangerous goods, Class 2).

Demand Respirator - A supplied-air respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.

Disposable Respirators - A respirator that is discarded after the end of its recommended period of use.

Elastomeric - Made of natural or synthetic rubber or rubber-like plastic.

Emergency - A situation or circumstance which, if not promptly eliminated, controlled, or contained could result in significant injury, illness or damage to property or the environment.

End-of-Service-Life Indicator (ESLI) - A system that indicates that the sorbent material is approaching saturation or is no longer effective.

Engineering Controls - A method of controlling a hazard, which involves making a physical change to the workplace (e.g., installing ventilation).

Escape-Only Respirator - A respirator intended to be used only for emergency exit only.

Filter - Filters remove particulates (e.g., dusts, mists, fumes, fibres) from the air by pass the air through a woven material with an electrostatic charge. Filters are color-coded magenta (pink-purple); however, the facepiece of disposable respirators is often white. Filters come in three efficiencies (95, 99, and 100) and three classes, based on oil resistance (N, R and P Series filters).

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

Fit Test - The use of a qualitative or a quantitative method to evaluate the fit of a specific make, model, and size of respirator on an individual.

Fume - A solid condensation particulate, usually of a vaporized metal (e.g., welding).

Gas - A substance that is in the gaseous state at ambient temperature and pressure.

Hazardous Atmosphere - Any atmosphere that is oxygen deficient, exceeds occupational exposure limits, presents a fire or explosion hazard, or contains an airborne toxic or disease-producing contaminant at hazardous concentrations.

Helmet - A rigid respiratory inlet covering that provides protection against impact and penetration.

Hood - A respiratory inlet covering that completely covers the head and neck and may cover portions of the shoulders and torso.

Hydrostatic Test - A calibrated expansion pressure test of the structural integrity of cylinders.

Industrial Hygiene - The science of protecting and enhancing the health and safety of people at work through anticipation, recognition, evaluation and control of hazards.

Immediately Dangerous to Life or Health (IDLH) - An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape.

Loose-Fitting Respirators - The part of a respirator that forms a partial seal with the face, does not cover the neck and shoulders, and can offer head or eye protection.

Multi-Functional Respirator - A respirator that is capable of operating in two modes within either air purifying or atmosphere-supplying groups (e.g., supplied-air with self-contained escape cylinder or a powered-air-purifying respirator capable of working in silent mode).

National Institute for Occupational Safety and Health (NIOSH) - A research agency that is focused on the study of worker safety and health.

National Fire Protection Agency (NFPA) - A global self-funded non-profit organization, established in 1896, devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards.

Occupational Exposure Limit (OEL) - A maximum concentration of a contaminants deemed to be acceptable, as defined by the authority having jurisdiction. In the absence of a regulated occupational exposure limit,

a qualified person with the approval of the authority having jurisdiction may establish a limit for the workplace.

Odour threshold - The lowest concentration of a contaminant in the air that can be detected by smell; usually given as a range based on individuals' differing abilities to detect odours.

Oil - Mineral, vegetable, and synthetic substances, and animal and vegetable fats that are generally slippery, combustible, viscous, liquid or liquefiable at room temperature, and soluble in various organic solvents such as ether but not in water.

Oxygen Deficiency - A condition based on an oxygen concentration or partial pressure below which a person can be adversely affected.

Personal Protective Equipment - Includes items such as respirators, protective clothing such as gloves, face shields, eye protection, and footwear that serve to provide a barrier between the wearer and the chemical or material.

Particulate - Airborne hazards including dusts, fumes, mists, fibres, and bio-aerosols (e.g., bacteria, virus, fungi, etc.).

Powered Air-Purifying Respirator - An air-purifying respirator that uses a blower to force the ambient air through air-purifying element into the users breathing zone.

Practical Exercise - Instruction, facilitator demonstration, and participant practice and subsequent demonstration of competency in procedures and practices required by the respirator program.

Pressure-Demand Respirator - A positive pressure supplied-air respirator that admits breathing air to the facepiece when positive pressure is reduced inside the facepiece by inhalation.

Qualified Person - An individual who possesses the knowledge, experience, and training in order to fulfill the competencies of their role(s) as defined in the RPP.

Respirator - A device that is tested and certified by an authority having jurisdiction and is used to protect the user from inhaling a hazardous atmosphere.

Respirator Seal - Where the respirator facepiece meets the users' skin.

Sanitization - The use of an accepted disinfectant product to clean and sanitize the surfaces of inanimate objects in order to mitigate or prevent the transmission of disease to humans.

Safety Data Sheets (SDS) - A WHMIS document which includes detailed information on hazardous products including the hazards, how to protect yourself and what to do in an emergency.

Self-Contained Breathing Apparatus (SCBA) - An accepted respirator that has a portable supply of breathing gas and is independent of the ambient atmosphere; this includes both open-circuit and closed-circuit respirators.

Sorbent - A material, such as activated charcoal that removes toxic gases and vapours as air is inhaled through a cartridge.

Structural Firefighting - The activities of rescue, fire suppression, and property conservation in buildings, enclosed structures, aircraft interiors, vehicles, vessels, aircraft, or like properties that are involved in a fire.

Supplied-Air Respirator - A respirator, air-supply hose, pressure fittings and either a hood, helmet or tight-fitting facepiece that supplies the user with compressed breathing air from an air compressor or compressed gas cylinder(s).

Surgical Masks - Surgical masks are designed to catch droplets produced during coughs and sneezes. Surgical masks were originally designed to protect patients from infectious bacteria that might be carried by their healthcare provider. Likewise, surgical masks can be used by patients with infectious diseases to help prevent the spread. They do not protect the user from inhalation of particulates, gases or vapours and cannot be used in place of respiratory protection.

Threshold Limit Value - Airborne concentrations of a chemical substance which is believed that nearly all workers may be repeatedly exposed, day after day, over a working lifetime without experiencing adverse health effects.

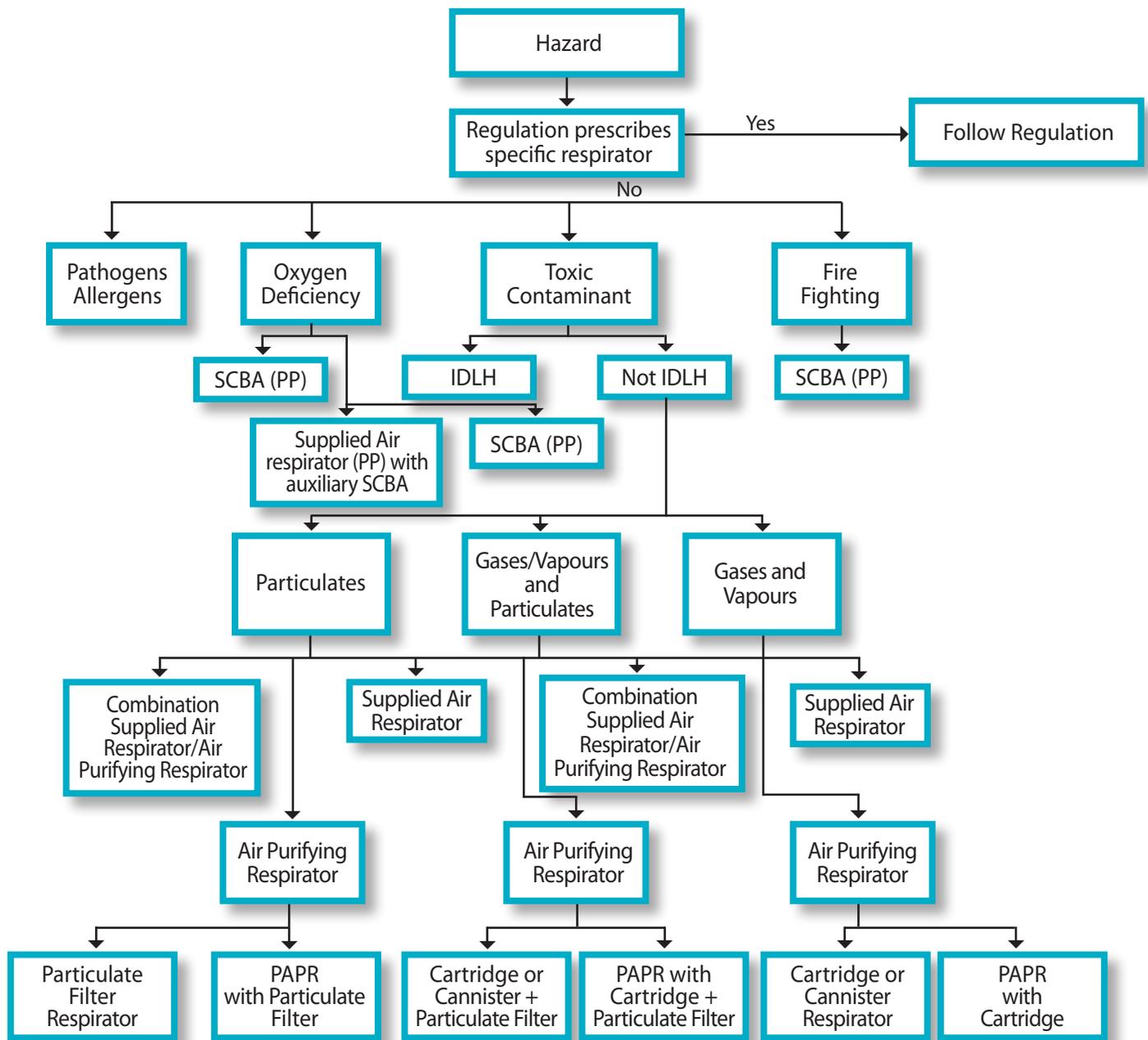
Tight-Fitting Respirator - A respirator that is designed to form a complete seal with the face or neck, including half-facepiece, both elastomeric and filtering-facepiece respirators, full-facepiece and certain hoods equipped with a tight-fitting seal. Note: This includes adhesive sealing respirators.

User Seal Check - An action performed by the respirator user to determine if the respirator is properly seated to the face.

Vapour - The gaseous state of a substance that is solid or liquid at ambient temperature and pressure.

Workplace Hazardous Materials Information System (WHMIS) - A hazard communication system which includes rules for hazard classification, labelling, safety data sheets (SDSs), and education and training.

Appendix 2 – Respirator Selection Flow Chart



- SCBA - Self-Contained Breathing Apparatus
- PP - Positive Pressure
- IDLH - Immediately Dangerous to Life and Health
- PAPR - Powered Air-Purifying Respirator

Appendix 3 – Assigned Protection Factors

Acceptable Level						Air-purifying options	APF	Atmosphere-supplying Options
0	1	2	3	4	5			
					5	No air-purifying option available	10,000	SCBA (pressure-demand) full-facepiece SCBA (pressure-demand) tight fitting hood Multi-functional SCBA/airline
					4 to 5	Powered air-purifying full-facepiece air-purifying helmet/hood with SWPF study	1,000	Airline (continuous flow) full-facepiece Airline (pressure-demand) full-facepiece Airline (continuous flow) helmet/hood with SWPF study
					3 to 5	Powered air-purifying half-facepiece Air-purifying (negative-pressure) full-facepiece	50	Airline (pressure-demand) half-facepiece Airline (continuous-flow) full-facepiece
					2 to 5	Powered air-purifying loose-fitting facepiece/visor Powered air-purifying helmet/hood SWPF study	25	Airline (continuous-flow) loose-fitting facepiece/visor Airline (continuous-flow) helmet/hood without SWPF study
					1 to 5	Air-purifying (negative-pressure) half-facepiece (including filtering facepieces)	10	No atmosphere-supplying option available
						No respiratory protection required	<1	No respiratory protection required
<p>Notes:</p> <p>(1) See tables 1 and 2 for fit test pass/fail criteria for tight-fitting respirators</p> <p>(2) Fit-testing is not required for loose-fitting respirators</p>								

Appendix 4 – Respirator User Screening Form

Source: CSA Z94.4-18 (Selection, use and care of respirators), Annex J.

PART 1: EMPLOYER INFORMATION

Employer name: _____ Supervisor name: _____

Worksite address: _____

Email: Telephone: () _____ Facsimile: () _____

PART 2: RESPIRATOR USER INFORMATION

Name: _____ Title/Occupation: _____

Email: _____ Telephone: () _____ Facsimile: () _____

PART 3: CONDITIONS OF USE

ACTIVITIES requiring respirator use: _____

FREQUENCY of respirator use: Daily Weekly Monthly Yearly Other

EXERTION level during use: Light Moderate Heavy Other

DURATION of respirator use per shift: < 1/4 h > 1/4 h > 2 h Variable Other

TEMPERATURE during use: < 0 °C > 0 and < 25 °C > 25°C

ATMOSPHERIC PRESSURE during use: Reduced Normal/ambient Increased

SPECIAL WORK CONSIDERATIONS

Firefighting Riot/Police activity Rescue operations Emergency escape

IDLH Oxygen deficiency Confined spaces Hazardous materials
(emergency)

Other: _____

Personal protective equipment required (specify): _____

Estimated total weight of tools/equipment carried during respirator use:

Maximum: _____ Average: _____

PART 4: TYPES OF RESPIRATORS USED (check all that apply)

- Tight-fitting Non-tight-fitting (e.g. hooded) SCBA open-circuit Mouth bit
- SCBA closed-circuit Air-purifying, non-powered Airline, continuous-flow SCBA escape
- Air-purifying, powered Airline, pressure-demand SCBA closed-circuit escape Supplied-air suit
- Multi-functional pressure-demand/Airline with escape
- Other (specify):

Signature of person being fitted: _____ Date: _____

PART 5: RESPIRATOR USER'S HEALTH CONDITIONS

(a) Some conditions can seriously affect your ability to safely use a respirator. Do you have or do you experience any of the following or any other condition that could affect respirator use?

- Yes No (Check Yes or No box only. DO NOT specify. Medical information is NOT to be disclosed on this form)

Shortness of breath – Breathing difficulties – Chronic bronchitis – Emphysema – Lung disease
 Chest pain on exertion – Heart problems – Allergies – Hypertension – Cardiovascular disease
 Thyroid problems – Diabetes – Neuromuscular disease – Fainting spells – Dizziness/ Nausea
 Seizures – Temperature susceptibility – Claustrophobia/ Fear of heights – Hearing impairment
 Pacemaker – Panic attacks – Colour blindness – Asthma – Vision impairment – Reduced sense of smell – Reduced sense of taste – Back/Neck problems – Unusual facial features – Skin conditions
 Dentures – Other condition(s) affecting respirator use – Prescription medication to control a condition

(b) Have you had previous difficulty while using a respirator? Yes No

(c) Do you have any concerns about your future ability to use a respirator safely?
 Yes No

A "YES" answer to (a), (b), or (c) indicates further assessment by a healthcare professional is required prior to respirator use.

Signature of respirator user: _____ Date: _____

PART 6: HEALTHCARE PROFESSIONAL PRIMARY ASSESSMENT (if required)

Assessment date: _____

Respirator use permitted: Yes No Uncertain

Referred to medical assessment: Yes No

Comments: _____

Reassessment date: _____

Name of healthcare professional: _____ Signature: _____

PART 7: MEDICAL ASSESSMENT (if required)

Assessment date: _____

Class 1. No restrictions

Class 2. Some specific restrictions apply (specify): _____

Class 3. Respirator use is NOT permitted.

Name of Physician: _____ Signature: _____

Appendix 5 – Respirator Fit Test Form

Name of Worker:		Fit Test Date:	
Does the worker wear or have: <input type="checkbox"/> Eye Glasses <input type="checkbox"/> Contact Lens <input type="checkbox"/> Dentures <input type="checkbox"/> Facial Hair If yes to any of the above, discuss how the respirator seal must be affected (workers must be clean-shaven).			
Does the worker have any medical concerns about wearing a respirator? If yes, refer worker for a medical assessment. <input type="checkbox"/> Yes <input type="checkbox"/> No			
Check when completed successfully. Do not proceed with fit testing unless all boxes are checked: <input type="checkbox"/> User Screening Form <input type="checkbox"/> Respiratory Protection Training <input type="checkbox"/> Correct Donning <input type="checkbox"/> Negative and positive-pressure user seal checks			
<input type="checkbox"/> Qualitative Fit Test		<input type="checkbox"/> Quantitative Fit Test	
<input type="checkbox"/> Pass		<input type="checkbox"/> Fail	
Make/Model/Size			
Make/Model/Size			
Fit Test Technician (Print):		Fit Test Technician (Signature):	
Comments:			

Appendix 6 - Program Evaluation Checklist

The following is an example of a program evaluation checklist that can be used to determine if your Respiratory Protection Program meets the current legislation and standards.

It is recommended that the results of the program evaluation be made available to the Occupational Health and Safety Committee, Worker Health and Safety Representative or Designate, and the program administrator, if applicable.

Item	Yes/No	If No, include the required action and responsible party
Is the legislation used to write this RPP current?		
Is the most current version of CSA Z94.4 (Selection, use and care of respirators) and CSA Z180.1 (Compressed breathing air and systems) used to write this RPP?		
Are the roles and responsibilities of the employer, program administrator, supervisors, workers and fit testers included in the RPP, and do they meet the legislation and standards?		
Has a respiratory hazard assessment of the workplace been conducted?		
Has personal exposure of workers (or similar exposure groups) been measured?		
Is a report of the findings of exposure assessment(s) available to workers?		
Where practicable, are respiratory hazards eliminated or reduced using engineering or administrative controls?		
Do preventative maintenance plans exist for controls, if applicable?		
Are warning signs posted on entrance to work area where respiratory protection is required?		
Is respiratory protection used where required?		
Is respiratory protection selected in accordance with CSA Z94.4 (Selection, use and care of respirators)		

Item	Yes/No	If No, required action and responsible party
use and care of respirators)?		
Are respiratory protection devices inspected, cleaned, maintained and stored according to the manufacturer's instructions?		
Have workers received respiratory protection training?		
Have workers successfully completed health surveillance?		
Do workers hold valid fit test certificates?		
Are all records maintained in accordance with the RPP?		

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