



## DEVELOPING A CODE OF PRACTICE FOR RESPIRATORY PROTECTIVE EQUIPMENT

This document can be used as a guide to help identify areas of concern relating to the use of respiratory protective equipment and to help meet the requirements of subsection 50(2) of the *Occupational Health & Safety Act*.



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## GLOSSARY

### **Aerosol**

A particulate suspended in the air.

### **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 material.

### **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 users.

### **Biological agents**

A term used to describe micro-organisms that are biological in nature and origin, to which exposure in sufficient quantities and duration may result in illness or injury to human health. Biological agents include bacteria, viruses, chlamydia, fungi and parasites, or parts thereof, or products generated by them. Reporting exposures to common agents such as cold and common influenza is not required.

### **Chemical agents**

A term used to describe all chemical elements and compounds in their natural state, or in a processed state, and their byproducts, the exposure to which, in sufficient quantities and duration, may result in illness or injury to human health.

### **Competent**

Defined in Regulation 91-191 as:

- a) qualified, because of such factors as knowledge, training and experience, to do assigned work in a manner that will ensure the health and safety of employees,
- b) knowledgeable about the provisions of the Act and the regulations that apply to the assigned work, and
- c) knowledgeable about potential or actual danger to health or safety connected with the assigned work.

### **Contaminant**

A substance that is either present in an environment where it does not belong or is present at levels that might cause harmful or adverse health effects.

### **Canadian Standards Association (CSA)**

Canadian Standards Association (CSA) is a standards development organization accredited as a certification body. CSA is a non-profit membership association serving industry, government, consumers and other interested parties in Canada and the global marketplace.

### **Dust**

Solid particles generated by mechanical processes such as crushing, rapid impact and grinding that are identical in chemical composition to the parent material.

### **Fume**

Solid particles formed when a volatilized solid, such as metal, condenses in air – such as metal fume, plastic fume, asphalt fume.

### **Gas**

A substance whose normal physical state is gaseous at ambient room temperature and pressure.

### **Immediately Dangerous to Life or Health (IDLH) atmosphere**

A condition in any worksite, space or area where a hazardous atmosphere exists to such an extent that a person without appropriate respiratory protection could be killed or suffer immediate, irreversible or incapacitating health effects.

### **Mist**

A mist is formed when a finely divided liquid is suspended in the air, such as oil mist produced during cutting and grinding operations, acid or alkali mists from pickling and electroplating, and paint spray mist from spraying operations.

### **NIOSH**

National Institute for Occupational Safety and Health. This is an American federal agency that conducts research in health and safety, tests and certifies respirators and performs training.

### **Oxygen deficiency**

An oxygen deficient atmosphere is defined in New Brunswick as an oxygen content below 19.5% by volume in air.

### **Qualitative fit test**

A pass/fail fit test to assess the adequacy of respirator fit that relies on the wearer's response to the test agent.

### **Quantitative fit test**

An assessment of the adequacy of respirator fit by numerically measuring the amount of leakage in the respirator.

### **Self-contained breathing apparatus (SCBA)**

An atmosphere-supplying respirator for which the source of breathing air is designed to be carried by the wearer.

### **Tight-fitting respirator**

A respirator face piece that forms a complete seal with the face.

### **User seal check**

An action conducted by the respirator user to determine if the respirator is properly sealed to the face.

### **Vapour**

The gaseous state of a substance whose normal physical state is liquid at ambient temperature and pressure (toluene vapour, gasoline vapour, etc.).

## PREFACE

Many workplaces have airborne concentrations of dusts, mists, fumes, aerosols, gases or vapours that necessitate the use of respiratory protective equipment, in addition to engineering and administrative controls. Section 45 of *Regulation 91-191* under the *Occupational Health and Safety (OHS) Act* requires employers to establish a written code of practice covering the proper selection, care, use, maintenance and fitting of the respiratory equipment that may be required at their workplace. This guide has been prepared to assist employers with this process.

The purpose of the code of practice is to identify the specific airborne hazards in the workplace and to clearly describe everything necessary for the safe application of a respiratory protection program.

Section 45 of *Regulation 91-191* requires the code of practice be developed in consultation with the Joint Health and Safety Committee (JHSC), a health and safety representative or with employees if there is no committee or representative. It should be kept as short as possible and written in language easily understood by employees.

The employer must ensure the code of practice is readily available and that employees are properly trained and adhere to the requirements of the code of practice.

The code of practice must comply with the Canadian Standards Association (CSA) standard Z94.4-11(R2016) *Selection, Use, and Care of Respirators*, and its companion standard Z180.1, *Compressed Breathing Air and Systems*, for workplaces requiring supplied air systems. These standards can be obtained by calling the CSA at 1 800 463-6727 or 416 747-4044 or visiting their website at [csagroup.org](http://csagroup.org).

Unless specified by the *General Regulation 91-191*, or by a health and safety officer, the following elements should be contained in a code of practice:

- 1. Roles and responsibilities**  
Who is responsible to administer and maintain the program in the workplace?
- 2. Hazard assessment**  
What airborne hazards do employees need to be protected against?
- 3. Respirator selection**  
Is the respirator CSA and/or NIOSH-approved for contaminants the employees will be exposed to?
- 4. Training**  
Have employees been properly trained in the selection, use and care of their respirators?
- 5. Respirator fit testing**  
Have employees been fit tested and field checked to ensure a proper facial fit with no leaks?
- 6. Use of respirators**  
Do supervisors ensure employees use and care for their respirators properly?
- 7. Cleaning, inspection, maintenance and storage of respirators**  
Are respirators in good condition and properly stored?
- 8. Health surveillance**  
Do employees have any medical conditions that could affect their ability to wear respirators?
- 9. Program evaluation**  
Is the respirator program evaluated regularly to ensure it's adequate to protect all employees?
- 10. Record keeping**  
Are records kept for all employees who wear respirators?

**IN ADDITION, SEE THE FOLLOWING APPENDICES:**

- Appendix A:** Sections of *Regulation 91-191* dealing with respirators
- Appendix B:** Respiratory protective equipment code of practice
- Appendix C:** References and other sources of information

# 10 COMPONENTS OF A CODE OF PRACTICE

## 1. Roles and responsibilities

The employer is responsible for ensuring the effectiveness of its respiratory program and that all individuals assigned a role in the program demonstrate and maintain competency in their respective roles. For the respiratory program to succeed, all employees, including management, must co-operate with the program administrator in the performance of their duties. The administrator's name, position, telephone number(s) and cellphone numbers, if any, should be put in the code of practice and made readily available.

The program administrator is required to manage the respiratory protection program and ensure, that employees are trained and use respiratory protective equipment in a manner that protects their health and safety.

## 2. Hazard assessment

To help choose the proper respiratory protection, all airborne hazards must be identified by a competent person and documented in the code of practice. Where possible, the average workday concentration and peak concentration for each airborne hazard should be determined. This information may already be available if previous air monitoring has been performed at the workplace. Air monitoring should be done for any hazards that require respiratory protection if airborne concentrations are unknown.

The types of airborne hazards that need to be identified are dusts, mists, fumes, aerosols, gases, vapours, oxygen deficiency or a combination of the hazards. Where possible, the specific chemical or biological agent should be listed. Information on engineering or administrative controls that must be used in conjunction with respiratory protection should be included.

The following questions should be asked when identifying the hazard.

- Is there a deficiency in the atmosphere oxygen?
- Is the atmosphere immediately dangerous to life or health (IDLH)?
- What is the physical form of the hazard (dust, mist, fume, aerosol, gas, vapour)?
- Is there more than one physical form present (such as dust and vapour)?
- What are the airborne hazard concentrations?
- What are the permissible exposure limits for the hazard in New Brunswick?
- How long are employees exposed to the hazard?
- What are the toxic properties associated with the hazard?
- How can the hazard enter the body?
- Does the airborne hazard have sufficient warning properties to allow the use of an air-purifying respirator (for example, the hazard may have a specific smell if it breaks through the respirator)?

### 3. Respirator selection

This is a critical part of any respiratory protection program and can only be performed after the hazards have been identified and evaluated. The key is to select the most appropriate respirator for the contaminants, keeping in mind the specific applications in the workplace. For example, it may be reasonable to use disposable respirators for occasional dust exposures at a workplace, while reusable respirators may be necessary for daily work exposures.

CSA standard Z94.4-11 (R2016) or a standard offering equivalent or better protection, section 7 is an excellent source of information for the selection of suitable respirators. It contains specific selection sequences for gas or vapour respirators, particulate respirators and combination gas, vapour and particulate respirators. See Appendix C for information on how to obtain this standard.

Only CSA and/or NIOSH-approved respirators or respirators with an equivalent approval can be used in New Brunswick. Compressed breathing air must comply with the purity requirements of CSA standard Z180.1, *Compressed Breathing Air and Systems*. This standard states that air produced by the breathing air system must be submitted for purity analysis to a qualified laboratory at least once every six months. The laboratory tests the breathing air for contaminants, such as carbon monoxide, carbon dioxide, oil, water content and more, to ensure the air is safe.

### 4. Training

It is vitally important that training be given to all employees and their supervisors involved in the selection, use and care of respirators. Training requirements for wearers must be clearly stated in the code of practice. The training must result in employees being able to apply the information in all situations as needed to protect their health and safety.

#### **Training must include:**

- A list of airborne contaminants, including the extent of exposures, the potential health effects and warning properties of the contaminants.
- The reasons for selecting a particular respirator, its capabilities and its limitations and an explanation of how it provides protection – for example, by filtering the air, absorbing the gas or vapour or providing clean air from an uncontaminated source.
- Sufficient medical information for employees and supervisors to recognize the symptoms of medical conditions that may prevent the employee from effectively using the respirator (shortness of breath, dizziness, etc.).
- Procedures on how to inspect, don, wear and remove the respirator.





- How to perform a user seal check.
- Procedures for maintenance and storage of respirators, including detailed training for employees responsible for their own respirators. Where specific personnel are assigned to perform these tasks, most employees may only need to be informed of the procedures in place.
- Procedures for cleaning and sanitizing respirators.
- Instructions on handling emergency situations.
- General requirements of the occupational health and safety legislation regarding respiratory protection.
- The code of practice for respiratory protective equipment at the place of work.

Under some circumstances, additional training may be necessary (new airborne contaminants or exposure conditions, for example). In addition, retraining should be offered at least every two years to reinforce employee knowledge about the correct use of respirators and other pertinent elements of the respiratory protection program.

## 5. Respirator fit testing

Adequate protection will not be provided if the respirator face piece does not fit the employee properly. The great variety of face sizes and shapes makes it impossible to fit all employees with the same respirator. Physical conditions such as heat, cold or cramped spaces may also increase employee discomfort and compromise facial fit. Several different respirator models and sizes may have to be tried to obtain a proper fit for each employee who requires a respirator.

The amount of protection afforded by a respirator is called the protection factor. The actual protection factor achieved with tight fitting face piece respirators depends mainly on the seal between the employee's face and the respirator.

**Fit testing** is required for all negative and positive pressure, tight-fitting face piece respirators. It demonstrates that the user can competently don and doff the respirator, inspect it, and perform a user seal check. Fit testing is to be performed before an employee starts wearing a respirator in the workplace or whenever a different respirator face piece is used. Employees should be fit tested at least every two years.

The employee must put on a respirator, position it on the face and set the strap tension before performing a fit test. The fit test must be performed using the same make, model, style and size of respirator that will be used by the employee being tested. Additional fit testing is necessary if a different respirator is used following the initial test or if the employee's physical structure changes significantly through weight fluctuations, scars, changes to dental structure or other conditions.

There are two fit testing methods for determining the fit and seal of respirators on the employee's face: qualitative fit testing and quantitative fit testing.



A **user seal check** shall be performed by an employee each time the respirator is worn. This procedure can be done on air purifying respirators that have filters or chemical cartridges and an exhalation port. After putting on the respirator, the employee covers the cartridges or filters with either their hands, or a piece of plastic, and tries to inhale, creating a negative pressure in the respirator. The face piece should collapse slightly, and no inward leakage of air should be detected. The employee then covers the exhalation port and gently exhales into the face piece, creating a small positive pressure. The face piece should bulge out slightly, and no air should escape. Most respirator manufacturers include instructions on how to perform a user seal check with their respirators.

A qualitative fit test is a pass/fail test that relies on the employee's response to an airborne test agent. First the employee dons the respirator and performs a user seal check.

Then a test agent is released around the face of the employee. Test agents include isoamyl acetate vapour (banana oil), irritant smoke, denatonium benzoate (Bitrex<sup>®</sup>), or saccharin, which are easily detectable by irritation, odour, or taste. If the employee cannot detect any penetration of the test agent into the respirator, then it is assumed the respirator seal on the employee's face is acceptable.

This, however, is a subjective test, which relies on the ability of the employee to smell or taste the test agent. For a few employees the test will be inaccurate because they are not able to smell or taste. Always check to make sure the employee can taste, smell or experience nasal irritation to the substance being used in the qualitative fit test.

Once the employee has passed the qualitative fit test, the assigned protection factor is determined from Figure 4 in the CSA standard Z 94.4-11-(R2016), *Selection, Use, and Care of Respirators*.

Qualitative fit test kits can be purchased from respirator suppliers. Make sure you follow the complete test protocol given by the manufacturer or refer to CSA standard Z94.4-11-(R2016), *Selection, Use, and Care of Respirators*, or a standard offering equivalent or better protection.

A quantitative fit test is performed using equipment to numerically measure the amount of leakage of a test agent into the respirator and compare the concentration inside the respirator to the concentration outside the respirator. Quantitative fit tests can be used for both air-purifying and atmosphere-supplying respirators.

The employee dons the respirator and performs a user seal check. Then, during the quantitative fit test the employee performs a series of exercises designed to simulate work movements such as normal breathing, deep breathing, turning head from side to side, nodding head up and down and talking.

Caution! Always remember that the fit test has nothing to do with the ability of the air-purifying components of the respirator to remove airborne hazards. The fit test is only used to evaluate the effectiveness of the respirator fit and seal on the employee's face. Never wear a respirator that does not fit properly.

## 6. Use of respirator

The program administrator and supervisory personnel must monitor the use and care of respirators to ensure the health and safety of employees is adequately protected (for example, employees wearing their respirators when required, respirators being worn properly and respirators in good repair).

A qualified person shall establish a schedule for replacing air-purifying filters or cartridges of respirators before their service life ends. Warning properties of the contaminant shall not be relied upon for cartridge or canister replacement.

## 7. Cleaning, inspection, maintenance and storage of respirators



A good cleaning, maintenance and storage program will ensure respirators remain effective throughout their use. The program must address cleaning, sanitizing, maintenance, storage and inspection.

Cleaning and sanitizing respirators increases employee acceptance, and helps prevent skin irritation and dermatitis. Respirators should be cleaned and sanitized between use and according to the respirator manufacturer's specification.

Respirators need to be inspected before each use. Respirators found to be defective must be removed from service and repaired or discarded. Worn or damaged valves, straps and other parts must be replaced using the original manufacturer's replacement parts as per their specification. Only trained individuals must do repairs on respiratory equipment. In some instances, specialized training may be necessary.

Respirators must be stored so they are protected against damage, contamination, dust, sunlight, extreme temperatures, excessive moisture and damaging chemicals. Each respirator needs to be stored in a position that retains its natural configuration. Respirator parts can warp when stored in an unnatural shape, resulting in a poor fit the next time the respirator is used. Respirators intended for emergency use must be stored in an accessible area.

Do not allow employees to leave their respirators unprotected in a contaminated work area. For example, an organic vapour cartridge can only adsorb a limited amount of vapour. If employees remove their air purifying respirators equipped with organic vapour cartridges and leave the respirators unprotected in a contaminated area, the organic vapour cartridges will continue to adsorb organic vapour until they can hold no more, and the cartridges become useless.

## 8. Health surveillance

Some respirators increase breathing resistance. A few employees may have difficulty wearing a respirator because of a medical condition or fitness level. In such cases, the employer must ensure that employees who are affected obtain clearance from a physician before wearing a respirator. The health of employees who wear respirators should be reviewed regularly.

## 9. Program evaluation

An annual review of the respirator code of practice ensures the program remains effective. It is important to consult with employees for their views on the effectiveness of the respirator program and any problems experienced (comfort level, resistance to breathing, vision restriction, difficulty communicating and interference with work performance, etc.).

## 10. Record keeping

Records should be kept for all employees who wear respirators. Records should include information such as:

- The contaminants to which the employee is exposed
- The type of respirator(s) used by the employee
- Fit testing records
- Training
- Medical clearance information

Upon completion, senior management should sign and date the document to acknowledge the company's commitment to the code of practice for respiratory protective equipment at their workplace.



## APPENDIX A

NEW BRUNSWICK *REGULATION 91-191*  
under the *OCCUPATIONAL HEALTH AND SAFETY ACT*  
(O.C. 91-1035)  
*Filed December 3, 1991*

### Respiratory Protective Equipment

- 45(1) An employer shall ensure that a code of practice concerning respiratory protective equipment is established for a place of employment at which respiratory protective equipment is required.
- 45(1.1) The code of practice referred to in subsection (1) shall contain the following information:
- a. the name of the employee responsible for implementing the code of practice;
  - b. a description of the respiratory protective equipment to be used to protect the health and safety of employees;
  - c. a description of any possible hazards that may affect the health or safety of employees;
  - d. the requirements for the proper selection, care, use, maintenance and fitting of the respiratory protective equipment;
  - e. the training requirements for employees who use respiratory protective equipment;
  - f. the record keeping requirements; and
  - g. the frequency by which the code of practice is to be reviewed.
- 45(2) An employer shall comply with CSA standard Z94.4-11 (R2016), “*Selection, Use, and Care of Respirators*” or a standard offering better or equivalent protection, in developing a code of practice.
- 45(4) An employer shall consult with the committee or health and safety representative, if any, or with employees if there is no committee or representative, in developing the code of practice.
- 45(5) An employer shall ensure that a copy of the code of practice is readily available to an officer upon request and to employees in the areas where the respiratory protective equipment may be required to be used.
- 45(6) An employer shall ensure that the code of practice referred to in subsection (1) is implemented and adhered to at the place of employment.
- 45(7) An employee shall adhere to a code of practice referred to in subsection (1).

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47 An employee who may be required to use respiratory protective equipment shall, for the purpose of ensuring that the equipment fits effectively, cooperate with any person identified in the code of practice referred to in section 45 and, if a tight fit is essential to the proper functioning of the equipment, be as clean shaven as is necessary to ensure an effective seal to the facial skin of the employee.

51.6(1) A firefighter who may be exposed to an oxygen deficient atmosphere or to harmful concentrations of air contaminants when engaged in structural fire-fighting or rescue shall wear positive-pressure self-contained respiratory protective equipment that meets or exceeds NFPA 1981, “*Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire Fighters*”, 1992 edition, together with a protective hood that meets or exceeds the requirements in Chapter 6-1 of NFPA 1971, “*Standard for Protective Clothing for Structural Fire Fighting*”, 1991 edition.

51.6(2) An employer shall ensure that a firefighter who is wearing self-contained respiratory protective equipment when engaged in structural fire-fighting or rescue is accompanied by another firefighter similarly equipped and having the same air capacity.

51.6(3) An employer shall ensure that the compressed breathing air used in self-contained respiratory protective equipment required under subsection (1) meets or exceeds CSA standard CAN3-Z180.1-M85, “*Compressed Breathing Air and Systems*”.

51.6(4) An employer shall ensure that self-contained respiratory protective equipment used by a firefighter when engaged in structural fire-fighting or rescue is equipped with a personal distress alarm device that meets or exceeds NFPA 1982, “*Standard on Personal Alert Safety Systems (PASS) for Fire Fighters*”, 1993 edition.

51.6(5) An employer shall ensure that CSA standard Z94.4-11 (R2016), “*Selection, Use, and Care of Respirators*”, or a standard offering equivalent or better protection is followed by concerning

- a) the training of users of self-contained respiratory protective equipment, and
- b) the use, maintenance and testing of respiratory protective equipment.

## APPENDIX B

### RESPIRATORY PROTECTIVE EQUIPMENT CODE OF PRACTICE

[Click here to create a code of practice for your workplace](#)

## APPENDIX C

### REFERENCES AND OTHER SOURCES OF INFORMATION

**1. Canadian Standards Association**

178 Rexdale Boulevard

Toronto, ON M9W 1R3

Order online at [csagroup.org/store](https://www.csagroup.org/store)

Phone: 416 747-4044

Toll-free: 1 800 463-6727

**2. American Conference of Governmental Industrial Hygienists (ACGIH)**

3640 Park 42 Drive

Cincinnati, OH 452401

Phone: 513 742-2020

Order online at [acgih.org/publications/introducing-digital-library/](https://www.acgih.org/publications/introducing-digital-library/)