



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.

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.

Dust

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

Field check

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

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 room temperature and atmospheric pressure.

Immediately Dangerous to Life or Health (IDLH)

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.

Protection factor

A quantitative estimate of the fit of a particular respirator on an individual and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn. CSA standard Z94.4-93 gives assigned protection factors for different types of respirators when qualitative fit testing is used.

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 face piece

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

Vapour

The gaseous state of a substance whose normal physical state is liquid at room temperature and atmospheric 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 JHSC 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 Z94.4-93 *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 www.csa.ca.

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. Administering the program**
Who is responsible to administer and maintain the program in the workplace?
- 2. Identifying the hazards**
What airborne hazards do employees need to be protected against?
- 3. Selecting the appropriate respirator**
Is the respirator NIOSH-approved for contaminants the employees will be exposed to?
- 4. Respirator facial fit**
Have employees been fit tested and field checked to ensure a proper facial fit with no leaks?
- 5. Training**
Have employees been properly trained in the selection, use and care of their respirators?
- 6. Respirator use**
Do supervisors ensure employees use and care for their respirators properly?
- 7. Cleaning, maintenance and storage of respirators**
Are respirators in good condition and properly stored?
- 8. Health surveillance of respirator wearers**
Do employees have any medical conditions that could affect their ability to wear respirators?
- 9. Evaluating the program**
Is the respirator program evaluated regularly to ensure it's adequate to protect all employees?
- 10. Records**
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:** Sample respiratory protective equipment code of practice
- Appendix C:** References and other sources of information
- Appendix D:** WorkSafeNB regional contact information

10 COMPONENTS OF A CODE OF PRACTICE

1. Administering the program

Employers must assign a competent person to administer the respiratory program. The administrator must be given the employer's full support. If the respiratory program is to succeed, all employees, including management, must be instructed to co-operate with the program administrator in the performance of their duties. The administrator's name, position, telephone number(s), pager 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, so far as is reasonably practicable, that employees are trained and use respiratory protective equipment in a manner that protects their health and safety.

2. Identifying the hazards

To help choose the proper respiratory protection, all airborne hazards must be identified 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. Selecting the appropriate respirator

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 Z94.4-93, section 6 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 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. Respirator facial fit

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 necessary for all negative and positive pressure, tight-fitting face piece respirators. 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. In addition, a simple field check should be performed before every respirator use.

A **field check** can easily 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 field check with their respirators.

A **qualitative fit test** is a relatively simple pass/fail test that relies on the employee's response to an airborne test agent. First the employee dons the respirator and performs a field check. Incorrect donning procedures can be reviewed and corrected after the test is completed.

Qualitative fit tests can only be used for air purifying respirators where airborne contaminate concentrations are known to be below assigned protection factors for the respirators.

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®), saccharin or some other acceptable test agent that is 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 Table 2 in the CSA standard Z 94.4-93.

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 Z94.4-93, *Selection, Use, and Care of Respirators*.

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 field 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.

5. 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. Training should be based on the employee's educational level and language background. 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 field 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.



6. Respirator use

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).

7. Cleaning, 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. If a respirator is used by more than one employee, it must be cleaned and sanitized between uses. Respirators that are issued for the exclusive use of an employee should be cleaned and sanitized each day.

The administrator should establish a change-out schedule for the replacement of air-purifying respirator cartridges before their useful service life is ended. The change-out schedule may include end-of-service-life indicators, maximum use time, reliance on good warning properties and breathing resistance, as appropriate. The administrator should also check with the respirator manufacturer for recommendations on maximum use times for cartridges. Respirators need to be inspected before each use. Respirators found to be defective must be removed from service and repaired or discarded. Cartridges or canisters near the end of their service life should be replaced. 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 of respirator wearers

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. Evaluating the program

A regular evaluation 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. Records

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)** Where an employer is required to provide respiratory protective equipment, the employer shall establish a written code of practice covering the proper selection, care, use, maintenance and fitting of the equipment that may be required to be used at that place of employment.
- 45(2)** An employer shall comply with CSA standard Z94.4-93, “*Selection, Use, and Care of Respirators*” in developing a code of practice.
- 45(3)** An employer shall ensure that the code of practice referred to in subsection (1) is, when followed, sufficient to provide for the health and safety of employees at the place of employment.
- 45(4)** An employer shall consult with the joint health and safety 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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- 46(1)** An employer shall implement a training program for an employee who may have to use, issue, test or maintain respiratory protective equipment or supervise an employee who may have to use respiratory protective equipment.
- 46(2)** An employer shall use clause 8 of CSA standard Z94.4-93, “*Selection, Use, and Care of Respirators*” as a guide to the necessary content of the training program required by subsection (1).

47 An employee who may be required to use respiratory protective equipment shall co-operate in attaining an effective fit of the equipment and, in particular, be as clean shaven as is necessary to ensure an effective facial seal.

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 CAN/CSA Z94.4-93, *“Selection, Use, and Care of Respirators”* is followed 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

SAMPLE RESPIRATORY PROTECTIVE EQUIPMENT CODE OF PRACTICE

Company:
Address:

1. INTRODUCTION

This code sets out requirements this company will follow for the proper selection, use and care of respiratory protective equipment at this workplace.

2. ADMINISTERING THE PROGRAM

Program Administrator:		
Phone No.	Cellphone No.	Pager No.

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

Employees are encouraged to bring all respirator issues to their supervisor and then, if necessary, to the program administrator. All employees must co-operate in the performance of the program administrator's duties.

3. HAZARDS AND RESPIRATOR SELECTION

Area / Procedure	Hazards	Respirator Type	Comments

Employees may use respiratory protection in other areas as the need arises with the program administrator's approval.

4. RESPIRATOR FACIAL FIT

Employees who may be required to use a tight-fitting respirator must be clean-shaven where the respirator meets the face to ensure an effective facial seal.

Employees who may be required to use a respirator must be fit tested by the following:

Qualitative fit test	<input type="checkbox"/>
Quantitative fit test	<input type="checkbox"/>

Before using a respirator, every employee must perform a field check.

5. TRAINING

All employees who wear respiratory protection must be trained in the following:

Airborne contaminants in your work areas	<input type="checkbox"/>
Symptoms and toxic effects of overexposure to contaminants	<input type="checkbox"/>
Respirator capabilities and limitations	<input type="checkbox"/>
Donning and field checking your respirator	<input type="checkbox"/>
Maintenance, cleaning, sanitizing and storage of your respirator	<input type="checkbox"/>
What to do in case of an emergency	<input type="checkbox"/>
New Brunswick legislation on respiratory protection	<input type="checkbox"/>
Company code of practice for respiratory protective equipment	<input type="checkbox"/>
Other: _____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>

6. USING THE RESPIRATORS

Employees must wear respiratory protection in the areas and for the work procedures described in section 3.

Supervisors must enforce the use of respiratory protection as described in section 3.

7. CLEANING, MAINTENANCE AND STORAGE OF RESPIRATORS

Each employee is responsible for cleaning, maintaining and storing their respiratory protective devices. Cleaning supplies, replacement parts and new respirators will be supplied by the company as needed.

8. HEALTH SURVEILLANCE OF RESPIRATOR WEARERS

Employees who have questions about their ability to wear a respirator due to health reasons are asked to report their concern to the program administrator. Those employees will be required to have a medical evaluation and obtain clearance from their physician or from _____ before using respiratory protection. The physician will be asked to inform the program administrator whether or not the employee is able to wear the respirator for the conditions or work procedures required at this workplace. The employer will not request any other information and will pay the cost of the medical evaluation.

9. EVALUATING THE PROGRAM

At least once a year, the program administrator will review the respirator program. The program administrator will consult with respirator wearers during the review.

The review will include the following:

Effectiveness and appropriateness of the respirators being used	<input type="checkbox"/>
Fit testing	<input type="checkbox"/>
Respirator wearer training	<input type="checkbox"/>
Respirator use, maintenance, cleaning and storage	<input type="checkbox"/>
Health surveillance of respirator wearers	<input type="checkbox"/>
Wearer suggestions for improvements in the respirator program	<input type="checkbox"/>
Possible workplace improvements to minimize respirator use	<input type="checkbox"/>
New respiratory equipment on the market	<input type="checkbox"/>

Signed:
Title:
Date:



APPENDIX C

REFERENCES AND OTHER SOURCES OF INFORMATION

1. Canadian Standards Association

5060 Spectrum Way, Suite 10
Mississauga, ON L4W 5N6
Order online at sales@csa.ca
Phone: 416 747-4044
Toll-free: 1 800 463-6727
Fax: 416 747-2510

2. American Conference of Governmental Industrial Hygienists (ACGIH)

1330 Kemper Meadow Dr.
Cincinnati, OH 45240
Phone: 513 742-2020
Fax: 513 742-3355
Order online at www.acgih.org/home.htm