

## Frequently Asked Questions on N95 Respirator



## Frequently Asked Questions Regarding N95 Respirators

This document is intended to address questions and concerns from all staff regarding the use of N95 respirators.

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## GENERAL INFORMATION ON N95s

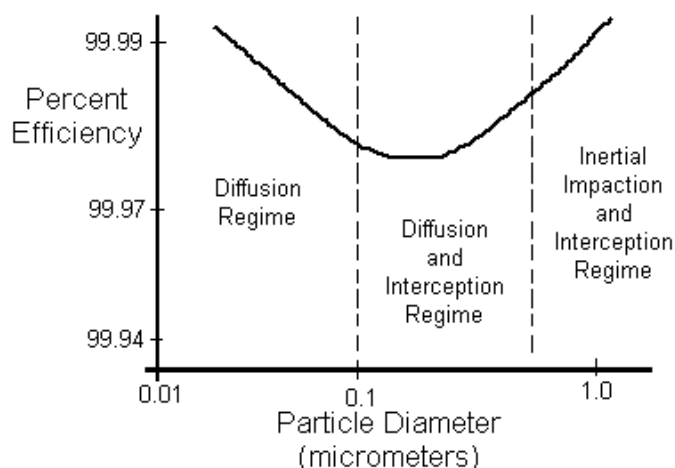
### What does N95 mean?

Personal equipment designed to provide a wearer with respiratory protection from contaminants are called *respirators*. Respirators used to provide protection against particulate and aerosols must be tested according to criteria laid out by the National Institute of Occupational Health and Safety (NIOSH). If a respirator passes using the NIOSH protocols, it will be classified as a “NIOSH approved” respirator.

Particulate respirators are used in industry as well as healthcare. These respirators are comprised of tiny fibres which are electrostatically charged. While it is not an issue in the healthcare setting, in certain industries, oil mists are present in the air. Oil mist will “coat” the electrostatically charged fibres and make the respirator less efficient. As a result, certain respirators are designed to be used in oil mist environments.

The first letter for the respirator rating is an “N”, “R”, or “P”. The “N” means that the respirator is “Not oil resistant”; the “R” means that the respirator is “Oil resistant”, and the “P” means that the respirator is “Oil proof”. In health care, oil mist is not a concern, and respirators with the “N” rating are used.

Next on the respirator rating is the filter efficiency when tested against particles of 0.3 micron size. The respirator is rated at either 95%, 99%, or 100% efficient. The 0.3 micron particle size is chosen because this is the particle size that the material is actually least efficient. Particles are filtered using two main methods. Particles larger than 0.3 microns are filtered through impaction and interception of the particles by the fibres. As particle size gets smaller, these mechanisms become less and less efficient. Very small particles are filtered using the electrostatic charge on the fibres and through a process called Brownian motion (small particles behave more like gases than they do like solids). As particle size increases, Brownian motion is a less efficient way of capturing particles. Therefore, particles greater or less than 0.3 microns are actually captured with much greater efficiency than they are for 0.3 micron particles.



Thus the rating of the respirator masks used in healthcare are “N95”. Respirators with 99% or 100% efficiency are typically only more efficient for 0.3 micron particles.

## **Do N95s provide protection against aerosols and droplets?**

**Yes.** N95 respirators are designed to provide at least 95% filtration efficiency against solid and liquid aerosols [of the 0.3 micron size] and droplets which may contain bacteria, viruses and dust.

## **Will an N95 provide protection against splashes?**

Proper face protection must be worn whenever there is the potential for any blood or body fluid splashes. If the mask or respirator comes in contact with blood or body fluids the respirator must be changed as soon as possible. Respirators should only be removed when the wearer is in an area that is considered free of airborne hazards.

## **Why are there different N95s?**

There are two main models of N95s in use in the Health Authority sites:

- 3M 1860 (also available in small size 3M 1860S)
- 3M 1870

The main reason for having more than one model is that staff have a variety of different face shapes and some models of N95 fit some face shapes better than others. To ensure that there are N95s available for the range of faces, a number of different respirator models and sizes are available.

## **Which of the N95s is the best?**

No particular make or model of N95 is any better than another in terms of protection provided. In order to receive the NIOSH N95 rating, respiratory protection must undergo and successfully complete a series of stringent tests.

Certain N95s will fit certain shapes of faces better than others. This is why it is important to undergo a fit-test and use only the model of N95 with which you passed.

## **Do any of the N95s contain latex?**

All standard N95s (3M 1860/1860S, 3M 1870, and the special order AO Safety Pleats Plus) are latex-free.

## **FIT-TESTING**

### **What is a fit-test?**

A fit test is a series of procedures used to determine if the N95 provides an adequate seal around the face. Without conducting a fit-test, there is no way to be certain that the N95 will be providing the full protection it is designed for.

The fit-test procedures take approximately 15 minutes. During this time an introduction of respiratory protection is provided, proper donning/doffing methods are reviewed, the selection and fit-test of the N95 is completed and other information required in order to use an N95 are detailed.

The fit-test procedure uses a product called Bitrex, one of the most bitter substances known, to illicit a taste response. Bitrex is comprised of water, table salt, and denatonium benzoate. It is the denatonium benzoate (a salt) that is important for the test as exposure results in a bitter taste. Bitrex can be detected at extremely low levels. The use of Bitrex is standardized as a validated method recognized by numerous agencies and jurisdictions, including WorkSafe BC, Canadian Standards Association, and Occupational Health and Safety Administration (OSHA - USA).

The first part of the fit-test procedure is the sensitivity test. A large hood, used to contain and concentrate the solution, is placed over the head of the staff. A dilute solution is injected into the hood until the taste is experienced by the staff. This step is required because different concentrations are required for different people and a small number of staff cannot detect Bitrex at all.

During the fit-test, the N95 is donned, the hood placed over the staff's head again, and a more concentrated Bitrex solution is added (100 times more concentrated). A series of six exercises are performed, each with a duration of at least 30 seconds. The exercises are designed to simulate movements that may occur while wearing the N95 in an actual working environment.

If no taste is experienced, the N95 properly fits the face. Only the model of N95 passed during the fit-test may be utilized, as only this type of model has demonstrated a good seal.

### **Is it safe to be exposed to Bitrex?**

The Bitrex solution used during the fit-tests is not an exposure hazard and not anticipated to result in adverse health effects. The amount of Bitrex actually used in the test is extremely low. People can detect Bitrex at 50 parts per billion (ppb) in water. A MSDS is available upon request.

### **I have asthma – is it safe for me to be exposed to Bitrex?**

Bitrex has not demonstrated any problem for individuals with asthma. Additionally, the amount of Bitrex actually used in the test is extremely low. People can detect Bitrex at 50 parts per billion (ppb) in water.

If an individual is required to wear a respirator and there is doubt about the individual's ability to use a respirator for medical reasons, prior to fit-testing the individual is to be examined by a physician to assess whether a respirator can be worn.

A MSDS is available upon request.

### **I am pregnant – is it safe for me to be exposed to Bitrex?**

Bitrex is safe for pregnant individuals. Additionally, the amount of Bitrex actually used in the test is extremely low. People can detect Bitrex at 50 parts per billion (ppb) in water. A MSDS is available upon request.

### **What if I cannot detect Bitrex during the sensitivity test?**

If you cannot detect Bitrex during the sensitivity test (and have eaten, smoked, drank (with the exception of water), or chewed gum or candy in the past 15 minutes), you may not be able to detect Bitrex at the concentrations required for a fit-test. If so, another alternative testing method may also be utilized – either a quantitative method (that does not rely on individuals' ability to taste a test agent) or a different test agent, substance called Saccharine, will be used.

### **What if I taste the Bitrex during the fit-test when I am wearing a N95?**

This means that a proper seal of the N95 to your face was not obtained. You will be asked to remove the N95 and re-don it. If you can still detect the Bitrex, a different model of N95 will be selected and fit-tested.

### **Why have I been told not to eat, smoke, drink (with the exception of water), or chew gum or candy for at least 15 minutes before my fit-test?**

Because the fit-test requires a taste response, certain foods and activities may interfere with your ability to taste. In order to efficiently utilize time, you will be asked not to participate in these activities for the 15 minute-period prior to the fit-test.

## **Do I need to be clean shaven in order to wear a N95?**

**Yes**, you must be clean shaven wherever the respirator comes into contact with the face. Facial hair (even very short stubble) interferes with the seal of the N95 to the face, thereby reducing its efficiency to provide respiratory protection.

## **Are the hoods used for the sensitivity test and fit-test cleaned between staff?**

Between uses, hoods are wiped down with an isopropyl alcohol solution.

## **What is an Assigned Protection Factor (APF)? What does an APF of 10 mean?**

An Assigned Protection Factor (APF) is a value assigned to a respirator by WorkSafe BC. It is the level of protection that the respirator can be expected to provide at least 95% of the time. Although not directly applicable to biological agents, the APF is used when selecting respirators for particular chemical substances. For example, an appropriate respirator with an APF of 10 would allow an individual to enter an atmosphere containing up to 10 times the exposure limit for the chemical.

The accepted practice for passing a fit-test is to require the respirator to demonstrate the ability to provide protection ten times the APF. For example, a respirator assigned an APF of 10 by the WCB, requires the respirator actually demonstrate a protection factor of 100 during the fit-test. This allows for an additional “safety factor” to be used when using the respirator in the “real world”.

N95s are fit-tested to demonstrate a protection factor of 100 during the fit-test (APF of 10 in the work environment). It is important to remember that APF are designed for substances with exposure limits (e.g. certain chemicals) and are not necessarily directly applicable for biological agents. However, Health Canada requires N95s provide a “*tight facial seal (less than 10% leak)*”.

## **Do I really need to be fit-tested?**

**Yes**. Fit-testing is required to ensure that the N95 is providing you the respiratory protection required of it. Without fit-testing a N95, you cannot be certain that it is offering you the degree of protection it is designed to provide. Fit-testing requirements are a WorkSafe BC, Canadian Standards Association, manufacturer, and Health Authority requirement.

**I have had a fit-test on a particular model of N95. Can I wear other models if they look similar?**

**No.** Different makes and models may utilize different materials (e.g. different straps) and although they may appear to look similar, they may fit your face quite differently. Only use the model of N95 for which you have passed a fit-test, as only this type of model has been tested and shown to provide you with a good seal.

**Now that I have been fit-tested on a N95 do I ever have to be fit-tested again?**

Fit-testing is required annually by WorkSafeBC. This is because individuals may experience physical changes over time (e.g. weight gain or loss) which can affect the fit of the N95. An annual fit-test also allows for a refresher on the issues surrounding the N95.

**USING N95s**

**How long can I wear a N95 for? How many times can I wear a N95?**

The length of time an N95 can be worn varies. If at any point the N95 becomes wet, soiled, damaged, or interferes with breathing, exit the area and following proper infection control protocols, remove the N95 and replace with a new one.

An N95 may only be used once. When an N95 is removed it must be discarded, even if it does not appear to be visibly contaminated. If it is necessary to enter the area again, a new N95 must be donned.

Use proper infection control protocols when removing the N95 and replacing with a new one.

**Can a N95 be decontaminated if it becomes soiled?**

**No,** N95 respirators are not designed to be decontaminated if soiled. If the N95 becomes contaminated remove it in an area free of inhalation risks and dispose of it.

**How do I dispose of the N95 once I have used it?**

Unless the N95 is visibly contaminated, it may be disposed of in regular waste. If it is visibly contaminated with Blood or Body Fluids or Cytotoxics, dispose of it along with other contaminated material in Biohazardous Waste or Cytotoxic waste as applicable.

## **How is donning and doffing done with an N95?**

The N95 should be the last piece of protective equipment removed.

Wash your hands with soap and water or alcohol hand cleanser **before** removing the N95. Doff the N95 in the reverse order of the donning procedure (make sure you do not “drag” it over your head!) Dispose of the N95 **and wash your hands.**

## **What is a User Seal Check?**

A user seal check is a quick, basic procedure you must do to help ensure that you have donned the N95 correctly. It is not the same, nor is able to replace, a fit-test.

## **How do I perform a User Seal Check?**

Conduct the user seal check as instructed during your fit-test session. Instructions are provided by the manufacturer and instruction pages are available from your manager, on the intranet, or from Workplace Health.

A basic user seal check will involve placing both hands over the N95 and inhaling and exhaling sharply. If air leaks around the nose, adjust the nosepieces. If air leaks around the edges, adjust the straps. If a proper seal cannot be attained, DO NOT enter the area. Consult your supervisor/manager.

## **When do I perform a User Seal Check?**

A user seal check must be performed every time you put on a N95 prior to entering the precaution area.

## **Will I be able to get enough oxygen if I use a N95?**

Yes. Gas molecules can pass freely through the N95. Individuals wearing a N95 easily obtain enough oxygen. Likewise, carbon dioxide levels inside the N95 are also at safe levels.

Individuals with compromised respiratory systems should not wear an N95 without obtaining medical clearance from their physician. By wearing a N95, the dead space of your lungs is basically increased. This means that breathing is slightly more labour intensive. While this does not affect a healthy individual, wearing a N95 should be avoided by someone with a compromised respiratory system. Remember N95 are meant for staff and should not be placed on patients.



## **Why do I feel uncomfortable when wearing a N95?**

This may be as a result of the fact that you are not used to wearing a respirator. First-time users of N95s may breathe more quickly than usual due to anxiety and/or are not used to wearing a N95. If at any point, breathing becomes difficult, you feel faint or dizzy, exit the area immediately and remove the N95 using proper infection control protocols.

## **Is it normal for my face to feel warm under the N95? Is it normal for my face to be red when I remove the N95?**

Yes. As you breathe out, your breath is warm and humid. This air will heat up the inside of the N95 which will make your face feel warm. This warm air will increase the surface temperature of the skin on your face, which can result in reddening of the skin. If at any point, breathing becomes difficult, you feel faint or dizzy, exit the area immediately and remove the N95 using proper infection control protocols.

## **My glasses fog up when I wear the N95. Does this mean that it is not working properly?**

Not necessarily, provided that you have been fit-tested and passed on that model, and that you have performed a user seal check immediately after donning the N95. When we breathe out, the inside of the N95 becomes positively pressurized. This means that the pressure inside the N95 will be greater than the surrounding air, and the air from inside will rush out. A large majority will pass directly through the material, but some may go around the outside of the N95.

When you breathe in however, the inside of the N95 becomes negatively pressurized. As a result, the N95 will collapse closer to your face and incoming air is forced to enter through the material.

The air we breathe out is warm and moist, and a small amount can fog up glasses. If you find your glasses tend to fog up, try adjusting them prior to entering an isolation area. You may also find it helpful to put antifog solution on the lenses to prevent them from fogging up.

If you wore your glasses during your fit-test, you probably noticed them fog up at that time as well. If you passed your fit-test, this will have demonstrated that even though they fogged up, the N95 provided sufficient respiratory protection.

### **Will air come in through the sides of the N95 if I move my head around a lot?**

During the fit-test process, a number of exercises are required to be performed, including turning your head side-to-side, nodding up and down, and talking. These exercises are used to simulate some of the extreme movements that can be performed in a care or work setting. A passed fit-test demonstrates that even while performing these types of exercises, the N95 provides sufficient respiratory protection.

### **When do I remove my N95?**

The N95 should only be removed in a clean area, such as in an anti-room. All other personal protective equipment (i.e. gown, gloves, eye protection, etc) must be removed prior to removing the N95.