

Respiratory Protection in Healthcare: N95 Respirators

During disease outbreaks, recommendations are often made to provide healthcare workers with respirators at least as protective as an N95 or similar particulate respirator. This quick reference guide is intended to help healthcare professionals better understand some important aspects of N95 respirators and address a few common questions such as - how an N95 respirator is different than a surgical mask, how do filters work, and can N95 respirators filter bioaerosols.

Healthcare workers commonly use surgical/procedure masks for patient care. The primary purpose of a surgical mask is to help keep spit and mucous generated by the wearer from reaching a patient or medical equipment. In addition, surgical masks act as a barrier and resist penetration by high pressure streams of liquids such as those that might result from a human artery being punctured during surgery. Surgical masks are not necessarily designed to seal tightly to the face, so air might leak around the edges. N95 particulate respirators, on the other hand, are designed to help reduce the wearer's exposure to airborne particulate hazards they may inhale including both bioaerosols (e.g. bacteria and viruses) and nonbiological aerosols. Respirators contain filter material and are designed to form a seal with the wearer's face, so that air passes through the filter (instead of around the edges) before it is inhaled.

In the United States, respirator performance is tested and certified by the National Institute for Occupational Safety and Health (NIOSH) and the selection and use of respirators is governed by the Occupational Safety and Health Administration (OSHA). OSHA specifies that only NIOSH certified respirators may be used when respirators are required in the workplace. NIOSH certifies particulate respirators based on many physical and performance factors including filtration efficiency. N95s and other particulate respirators are made using non-woven fibrous filter media to capture particles. These fibers crisscross to form a web of many layers. Particles are trapped, or captured, by several different mechanisms as the airstream flows through the layers of filter media. For example, very large particles in the airstream will settle out due to gravity, other particles may impact a fiber and be captured, and very small particles are captured by diffusion. N95 respirators have a filtration efficiency of at least 95% against non-oily particles when tested using the NIOSH criteria. The particles used to test the filtration are in the size range that is considered the most penetrating therefore the test methods ensure the filter media can filter particles of all sized with at least 95% efficiency.

This document has an associated video. Click the link below to access the video.

Watch this short educational video for additional information on N95 respirators.

[Respiratory Protection in Healthcare: What is an N95 Respirator?](#)

Additional 3M Resources

Description	Link
Surgical Masks, Standard N95s, Surgical N95s: A comparison	https://multimedia.3m.com/mws/media/2048279O/surgical-masks-standard-n95s-surgical-n95s-a-comparison.pdf
Possible Alternatives to Surgical N95 Respirators (in US and Canada): Healthcare	https://multimedia.3m.com/mws/media/1798135O/possible-alternatives-to-surgical-n95-respirators-in-the-us-healthcare-technical-bulletin.pdf
Respiratory Protection FAQ: Healthcare	https://multimedia.3m.com/mws/media/1792732O/respiratory-protection-faq-healthcare.pdf
Mask vs Respirator Video	https://multimedia.3m.com/mws/media/1054432O/healthcare-mask-vs-respirator-video.mp4

Other Available Resources

- [Hospital Respiratory Protection Program Toolkit](#) – joint effort of U.S. OSHA, U.S. Centers for Disease Control and Prevention (CDC), and U.S. National Institute for Occupational Safety and Health (NIOSH)
- [NIOSH science blog “N95 Respirators and Surgical Masks”](#) Lisa Brosseau, ScD, and Roland Berry. October 14th, 2009

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1. Right click on the hyperlink text and select “Copy Link Location.”
2. Open your Google Chrome browser. Click this [link](#) if you need to download Google Chrome. NOTE: You will not be able to download the videos using Microsoft Edge.
3. Paste the link into the search bar in Chrome.
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