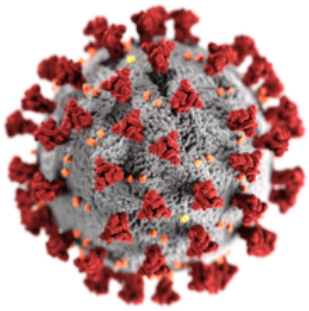
MASKS & RESPIRATORS



Filtering the Coronavirus

Respirators and masks with an *N95* rating must exclude 95% of test particles of *0.3 microns (300 nanometers)* or larger. The *N99* and *N100* filters exclude a greater percentage of such particles. 42 CFR 84. The ***Coronavirus*** (SARS-CoV-2) (COVID-19) is ***50 to 200 nanometers*** in diameter, so it is somewhat smaller than the test particles used in rating *N95*, *N99* and *N100* filters.

Biological Aerosols

It is important to understand that the ***Coronavirus*** does not float in the air by itself. It is transported from one person to another on droplets of excretions from sneezing and coughing. These particles are typically ***5 microns*** (*5,000 nanometers*) or larger. So, when an *infected* person wears an ***N95*** respirator or mask, it can be reasonably effective at preventing infectious material from leaving the patients body. When an ***N95*** respirator or mask is worn by an *uninfected* person, it can substantially prevent inhalation of material carrying the virus.

Masks and Respirators

Surgical masks and **dust masks** are made of filter material with two elastic straps. They often are ***not*** made with the same quality or amount of filter material. A surgical mask made of gauze is useful for blocking very large particles and keeping out splashes of liquid, but it is ***not*** very efficient at blocking *bioaerosols*, like those that contain the ***Coronavirus***. Unless the mask has genuine certification markings that indicate its efficiency, it must be assumed to be of low efficiency.

Surgical masks and **dust masks** are ***not*** designed to seal tightly against the user's face. During inhalation, a small amount of potentially contaminated air will pass around the sides of the mask, instead of passing through the filter material itself.

Dust masks are available with or without a valve. The valve allows exhaled air to escape more easily. The masks with a valve are more comfortable to use because they offer less resistance to exhaling and they retain less moisture in the mask.

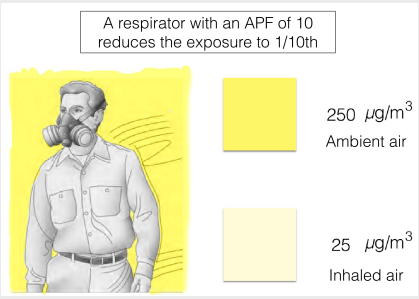
Respirators are made of elastomeric material and incorporate a replaceable cartridge that contains filter material. They come in various sizes and must be individually selected and fit-tested to the wearer's face to provide a tight seal. *OSHA* distinguishes between the terms "*mask*" and "*respirator*", but many people use the terms interchangeably.

Ratings for Dust Masks and Respirators

The ***filter material*** used in respirators and masks should have NIOSH-rated markings, e.g. ***N95***. The letter portion of the markings refers to how well the filter performs with oil-based

Respirators aren't Perfect

Properly-fitted, half-faced filter cartridge respirators are given an assigned protective factor (APF) by OSHA of **10**, meaning that they are expected to reduce exposure to the contaminants in the air by a factor of 10, or 90% - *regardless of the filter cartridge used!* Why? Because such respirators are known to intermittently leak around the face seal during use.



In practice, general testing reveals they are often more efficient than the APF would suggest. However, ***if you want greater protection, you must use a powered air-purifying respirator (PAPR) or a supplied-air respirator (SAR).***

PAPR
APR = 25

SAR
APR = 1000

Its best to use these respirators if available.

aerosols, such as when working around lubricants or cutting oils. ***N*** is not resistive, ***R*** is resistive and ***P*** is protective. Sometimes color-coding is also used to reflect the features of the filter. Filters with designations ***N***, ***R*** and ***P*** are all equally effective at filtering ***Coronavirus***.

The number portion of the marking indicates the percentage of standardized test particles - *0.3 microns or greater* - that the material will filter from the ambient air. For example, ***N95*** filters will capture 95% of such particles, ***N99*** filters will capture 99% of such particles, and ***N100*** will capture 99.7% of such particles. 42 CFR 84.

Cleaning Masks and Respirator Filters

The ***Coronavirus*** is encased in a lipid envelope, basically a layer of fat, that makes it vulnerable to desiccation, heat and detergents as it travels between host cells. On surfaces, it can be easily deactivated with bleach, *Lysol* disinfectants and UV-C light.

Scan this QR Code with the camera on your cell phone to see the U.S. Environmental Protection Agency (EPA) list of 82 registered disinfectant products that have been qualified for use against ***Coronavirus***.

Which Filter is Best to Use?

The ***N-***, ***R-*** and ***P95*** masks are deemed adequate for working with most *bioaerosols*, and the designations ***N-***, ***R-*** and ***P99*** and ***100*** are only marginally more efficient. The weakness of such masks and respirators is their tendency to allow contaminated air to enter around the edges, and the thickness, density and composition of the filter material doesn't reduce that problem.

Scan this QR Code with the camera on your cell phone to see the Centers for Disease Control (CDC) *frequently asked questions* about masks and other personal protective equipment (PPE) for use with the ***Coronavirus***.