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# Face masks have different purposes, protective levels

By **Stephanie Leonard**

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Photo courtesy Stephanie Leonard

**I**f you're following the news, you're seeing more images of people wearing face masks in the past few weeks than ever. The global spread of novel coronavirus causing the infectious disease COVID-19 has put face masks in the headlines.

But masks are also important for agricultural tasks. This article reviews the types, selection and proper use of face masks and particulate-filtering respirators.

### **NIOSH-approved respirators**

“Particulate-filtering respirators” are devices that cover the nose and mouth and protect against harmful airborne liquid and solid particles, including dusts, mists, smoke, metal fumes and fibers, and bacteria, viruses and spores.

They're held in place by at least two straps that fit around the head, creating a tight and complete seal with the user's face to prevent leakage around the edges when the user inhales.

Respirators are available in three configurations: disposable filtering facepieces and reusable half- and full-facepieces with replaceable filters.

The National Institute for Occupational Safety and Health (NIOSH) conducts rigorous tests to evaluate and approve particulate filters for use in the workplace. These protocols use a “most penetrating” particle size (0.3 micron) and test agents that are likely to degrade filters.

Through testing, approved filters are assigned one of three filter efficiency designations:

- 95: Removes at least 95% of particles;
- 99: Removes at least 99% of particles;
- 100: Removes at least 99.97% of particles

Filters are also assigned one of three oil resistance designations:

- N filters (N95, N99 and N100) are not resistant to oil; these should only be used for solid particles and water-based mists;
- R filters (R95, R99 and R100) are somewhat resistant to oil; these should not be subjected to oil particles for over eight hours;
- P filters (P95, P99 and P100) have greatest resistance to oil.

P-series filters should be chosen if oil particles are in the environment. Examples of oil products are sprayed lubricants, cutting fluids, glycerin, crop oil, release agents, oil-based paints and dust suppression oils.

The most common filters in work settings are N95, N100 and P100.

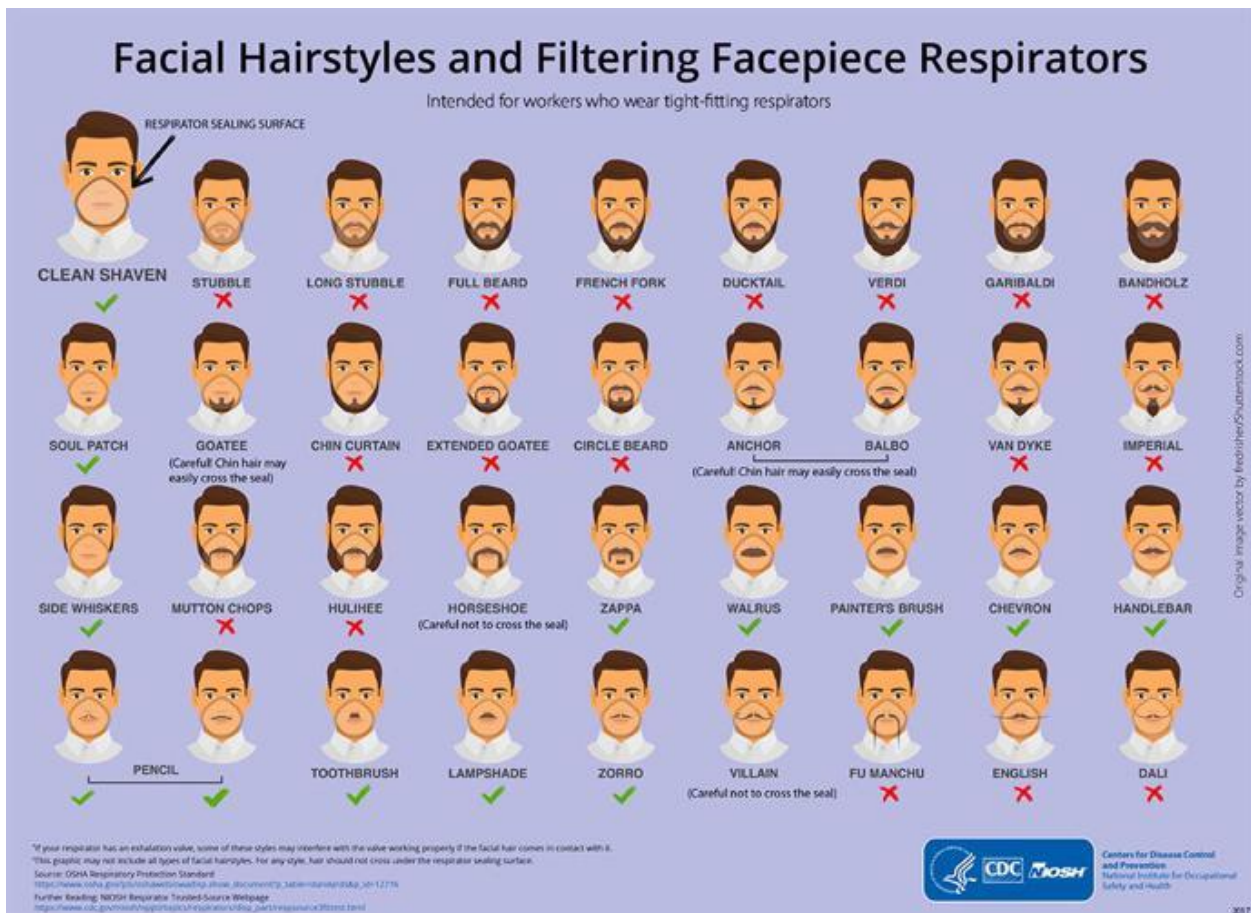
N95 respirators (and those with higher efficiency) are widely used for protection for low-toxicity, non-oil particulates across industry sectors, including agriculture. N95 respirators are also approved for protecting health workers caring for or having potential exposure to patients with respiratory infections such as tuberculosis, SARS and COVID-19.

Highest efficiency filters (N100, R100 and P100) are specifically required for work in low concentrations of toxic substances including lead dust, weld fumes and asbestos fibers. High concentrations of these substances require more sophisticated respirators that supply clean air.

Respirators should be fit-tested to assure protection. Fit testing measures leakage around the face seal that may not be detectable to the user. Fit testing is available through occupational clinics, industrial hygiene and safety professionals, and some respirator suppliers.

The effectiveness of any NIOSH particulate-filtering respirator is highly dependent on proper use and training. Training should cover information on limitations, care, replacement and work practices.

Some common mistakes include:



Facial hairstyles that interfere with the respirator seal are marked with red X.

Source: CDC/NIOSH

## **Surgical masks**

Surgical masks are fluid-resistant devices cleared by the U.S. Food and Drug Administration designed to protect the user against sprays, splashes, large droplets and bodily fluids or hazardous liquids. They also protect patients and bystanders from the wearer's respiratory emissions.

Surgical masks fit loosely and may attach by straps over the wearer's ears or behind the head. Leakage is expected around the edge of the mask when the wearer inhales.

Surgical masks are not considered respiratory protection.

## **Non-regulated devices**

Paper masks labeled "non-toxic dust masks" or nuisance dust masks are commonly found in retail stores and do not have NIOSH or FDA approval or certification. Product information usually states these are not for use with toxic particulates, e.g., lead, asbestos or silica.

While low-cost "non-toxic dust masks" may initially resemble NIOSH-approved particulate respirators, they typically have one strap and a thin paper-like filter that doesn't filter sub-micron size particles, and don't provide an effective facial seal.

## **Informed selection**

When you're looking for protection against harmful particles, choose a NIOSH-certified respirator. These clearly state NIOSH approval numbers or "NIOSH" on the facepiece, straps, and/or exhalation valve and product packaging.

Remember, the highest filter efficiency or most oil-resistant respirator won't protect if there are leaks or gaps around the seal. Get fit-tested to assure the proper size and seal for your face.

For more information on particulate respirator use in agriculture, visit [bit.ly/39CFYV7](http://bit.ly/39CFYV7).

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