

September 7, 2020



FACE COVERINGS FOR  
INDUSTRIAL WORKERS

DURING A PANDEMIC

AN OCCUNOMIX WHITE PAPER



## FACE MASKS DURING A PANDEMIC

# CORONAVIRUS

COVID-19



## STOP THE SPREAD

### ECONOMIC IMPACT

The Coronavirus Disease 2019 (COVID-19) has reached every corner of the globe and affected tens of millions of lives, so it is worth spending a few moments to put this pandemic into perspective. It has taken its place as the most devastating pandemic since the Spanish Flu of 1918 which ultimately affected 10x as many people globally. While businesses were generally not mandated to close during the Spanish Flu, worker absenteeism due to either sickness or fear of contracting the flu reduced output in several key industry sectors by as much as 10 to 20% in weeks of high excess mortality. Output declines were the result of labor-supply rather than demand shocks as business shutdowns only lasted on an average of 28 days during the Spanish Flu. The economic firestorm of COVID-19 has put millions out of work in almost every industry, so it is imperative to find an effective way to get people back to work.

In terms of duration, the Spanish Flu of 1918 lasted about 24 months, before dying out. COVID-19 is expected to be a serious threat to our society for up to 2 years as well.

Lockdowns, isolation and other forms of mitigation have helped to slow the spread, but asymptomatic people are a great risk to the public, as they can be sick without even knowing it. So without some form of prescribed protection for them, and those around them, this disease will continue to spread.

### COVID-19 PRESCRIPTIONS

As the world's top doctors and scientists scramble to find a vaccine or cure for this disease, the Center for Disease Control and World Health Organization have formulated guidelines and recommendations to help stop the spread of the disease as much as possible. While we will review their guidelines in more detail, the measures prescribed boil down to three simple actions:

- frequent and thorough hand washing
- social distancing of at least 6 feet in public places
- face coverings



## FACE MASKS DURING A PANDEMIC

### WORKPLACE RISK ASSESSMENT ACCORDING TO WHO

The World Health Organization (WHO) has focused their prescription on risk assessment. Work-related exposure can occur anytime at the workplace, during work-related travel to an area with local community transmission, as well as on the way to and from the workplace. The risk of work-related exposure to COVID-19 depends on the probability of coming into close or frequent contact with people who might be infected with COVID-19.

According to the WHO, the following risk levels may be useful in carrying out a workplace risk assessment for exposure to COVID-19 and planning for preventive measures in non-healthcare workplaces

**Low exposure risk** – jobs or work tasks without frequent, close contact with the general public and other co-workers, visitors, clients or customers, or contractors, and that do not require contact with people known to be or suspected of being infected with COVID-19.

Examples: Office workers, truck/delivery drivers, meter readers, maintenance, warehouse, landscaping, security guards, remote workers or those working in open air areas with some potential for distancing while working.

Action Required: Aside from face coverings, workers should continue to use the PPE, if any, that they would ordinarily use for other job tasks. Installation of protective barriers where adequate distance is difficult to maintain.

**Medium exposure risk** – jobs or work tasks with close, frequent short-interval contact with the general public, or other co-workers, visitors, clients or customers, or contractors, but that do not require contact with people known to be or suspected of being infected with COVID-19. In areas where COVID-19 cases continue to be reported, this risk level may be applicable to workers in high-population-density work environments or work tasks that require close and frequent contact between co-workers. In areas without community transmission of COVID-19, this scenario may include frequent contact with others.



Medium Risk Examples: Building construction workers, transportation, law enforcement, manufacturing workers, food service and those working in teams or encounter the general public

Action Required: Keeping distance of 6 feet whenever possible, protective barriers, restriction of public access to worksites, minimize face-to-face contact, medical screening (taking of temperatures when entering the workplace). Use of proper face covering or PPE when required, depending on work environment.

**High exposure risk** – jobs or work tasks with high potential for close contact with people who are known or suspected of having COVID-19, as well as contact with objects and surfaces possibly contaminated with the virus.

Examples: Healthcare Workers, First Responders

Action Required: Surgical Masks (N95), face shields or goggles, gowns, and gloves



## FACE MASKS DURING A PANDEMIC



### FACE MASKS – THE NEW NORMAL

As COVID-19 took hold of the world's population, we realized that medical professionals that treat the infected must be given priority for surgical masks, the most protective face masks available. As a result, a whole new market was created; cloth face coverings. The CDC, WHO and even governing organizations such as OSHA and many local governmental authorities have all recommended the use of cloth face coverings for individuals in public. The main goal of face coverings is less about protecting you from others (minimal personal protection), and more importantly to protect others from you (source control to prevent community spread). Both of these are very important topics to be covered in the next section.

Given all the information provided by the governing bodies and health professionals, most places have made face masks mandatory in order to enter any public place of business. As we return to work, we will be required to wear them on the job around others in close-proximity as well. Workers often have to work in tight quarters indoors and outdoors as part of their jobs. Even truckers and landscapers will encounter the public in limited interactions. As we spend countless work hours around each other, we need to protect each other.



## FACE MASKS DURING A PANDEMIC

### SOURCE CONTROL VS PERSONAL PROTECTION

Source control is the use of a face mask as a simple barrier to help prevent respiratory droplets from traveling into the air and onto other people when the person wearing the mask coughs, sneezes, talks, or raises their voice. This recommendation is based on what we know about the role respiratory droplets play in the spread of the virus that causes COVID-19, paired with emerging evidence from clinical and laboratory studies that shows masks reduce the spray of droplets when worn over the nose and mouth. COVID-19 spreads mainly among people who are in close contact with one another (within about 6 feet), so the use of masks is particularly important in settings where people are close to each other or where social distancing is difficult to maintain.

Recent testing and studies performed by Florida Atlantic University have shown that wearing a face mask drastically reduces the travel of aerosol particulates from a cough or sneeze, which on average, can travel up to 8 feet without a mask as seen in figure 1. In this study, a simple 2-layer cloth mask mitigated the spray, allowing droplets to only travel 2 ½ inches from the face (figure 2). The studies and tests have also shown that single-ply face coverings do a good job at reducing spray, limiting it to roughly 18 inches from the face (figure 3). This shows that ANY face covering is better than none at all.



No Mask  
(figure 1)

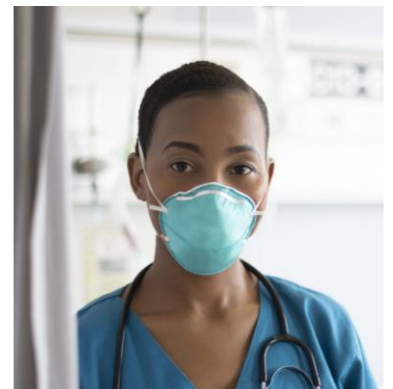


Cloth Source Control  
Mask  
(figure 2)



Cloth Source Control Mask  
(figure 3)

In contrast, Personal Protection Equipment, when referring to masks, is what healthcare workers use to protect themselves from those they treat. The most common PPE is an N95 mask. N95 masks have layers of specialized filter material that will keep out virtually any small particle. These masks must also be worn correctly as they are built specifically to seal air around the nose, cheeks and chin. As a result, these should be reserved for healthcare workers whenever possible, as they are at the highest risk of transmission and have the training to use them. These PPE masks should not be reused or washed, like source control masks. So strict guidelines of use and disposal are typically followed by the professionals who wear them. Also note, PPE masks utilize straps that go behind the neck and head, as opposed to behind the ears, to help maintain the seal as seen in figure 4.



PPE – N95  
(figure 4)



## FACE MASKS DURING A PANDEMIC

### SO MANY OPTIONS – HOW TO CHOOSE THE BEST CLOTH FACE COVERING



With Covid-19 remaining a factor for an extended period of time, we recommend that companies and workers consider reusable face covers – that is, face coverings that can be washed and reused. There is potential for workers to wear disposable masks longer than recommended, and not disposing after single use, which can spread the virus if it lives on the surface of the disposable mask. It is much easier and economical to wear a reusable, washable face mask. It's as easy as throwing it in the laundry – so it is worth the investment.

- 1) Comfort – How likely is someone going to be willing to keep one on? Any mask is better than no mask, so it is imperative for workers to keep them on, or handy.
  - Form fitting, as constantly adjusting and frequent touching of the mask is not recommended. Look for adjustable straps and a design that is made to follow the contours of a person's nose as well as chin.
  - Flexibility to be pulled down briefly when absolutely necessary, adjust by the straps as opposed to the mask itself – particularly in low risk environments with intermittent contact with others, or the need to speak or eat/drink.
  - Integration with other equipment (hard hat, helmet, uniform) – should fit comfortably around the neck and head and under any form of head protection given that other PPE may be required to be worn, and the mask should not interfere with that.
  - Communication – Mask should not make your voice excessively difficult to hear from 6 ft apart
- 2) Durability – How long will it continue to be useful as a mask? In demanding workplaces, you want a mask that is built to last; therefore we choose reusable. Disposable masks worn for longer than the intended use will accumulate contaminants and will be less effective, whereas a washable mask will remain effective, but it must be able to withstand frequent laundering.
  - Mask should be able to stand up to the harshest working conditions (abrasion, dust, etc.) without potential for damage during a work shift.
  - Able to maintain its integrity for more than 25 washes in 133° F water and soap, which effectively kills the virus, according to the WHO
- 3) Efficacy – The purpose of the mask is to prevent spread (source control), so while high efficacy is less important than simply wearing a mask, several features (explored more in the next section) can help one choose between masks of similar price. Again - any mask is better than none, but as risk goes up or when choosing between masks, you may want to consider 3 things:
  - Filtration – Duck cotton canvas filters better than most other standard cotton options
  - Breathability – Densely woven cotton is breathable, and still has high filtration levels
  - Fit – Mask must adequately cover your face, without gaps. Worn snugly against the face, hugging the contours of the nose, cheeks and chin



# FACE MASKS DURING A PANDEMIC

## THE RIGHT MASK FOR THE RIGHT RISK LEVELS

As lockdowns ease, and people are returning to work, companies need to thoroughly evaluate the risk levels in the workplace, per the information provided on page 2 from the WHO. In addition to any structural changes that need to be made to make the workplace safer for employees, face coverings need to be high on the priority list as well. We see two basic types of reusable face coverings being relevant; those that protect in medium level risk environments, and those sufficient for low risk environments.

### MEDIUM RISK ENVIRONMENTS:

In a medium risk environment, workers will require a mask that is not only comfortable, but effective for longer and closer periods of interaction with others. While source control is still the main issues (i.e., wearing a mask), you might want to consider certain features for the industrial worker that has to be in that closer/confined space for longer periods of time with others.

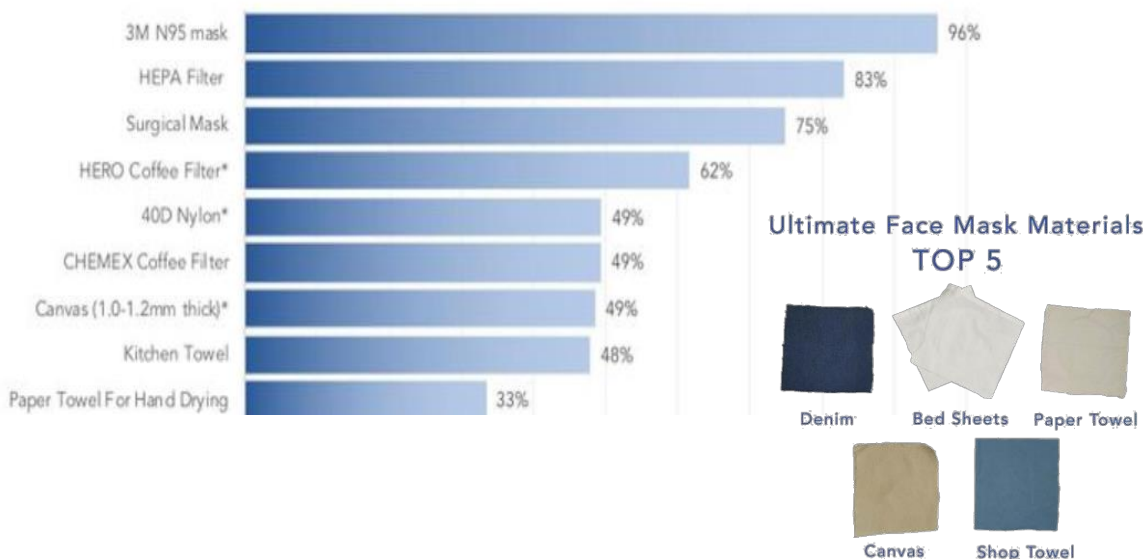
First consider the materials to make the face covering itself. According to extensive testing of various cloth materials for face masks, SmartAir provided the 5 best materials for mask construction. Some of the parameters tested and analyzed were microparticle filtration, breathability and durability. Obviously, surgical mask materials for PPE perform the best. After surgical mask materials and other non-washables, high denier nylon as well as canvas performed at the top of the list as tightly woven fabric material. That is why OccuNomix LUX-CFM face mask (see image at right) is constructed with canvas, because of its superior filtration, as well as its rugged durability and breathability after washing.

Adding a second layer of softer fabric (like cotton) adds to the filtration capability and makes the mask more comfortable for the full eight-hour shift. This is why some governing bodies suggest 2-ply construction for medium risk applications. For those still concerned about risk, adding the functionality of a pocket gives flexibility to those fewer workers who want the highest level of filtration without using a respirator. That is why OccuNomix has built these features in.

Other features to consider in industrial, medium risk environments include:

- Over-the-head straps as over the ear straps can irritate worker's ears after eight hours
- Strap adjusters that do not interfere with other PPE (i.e., hard hats or earmuffs) and are durable enough to withstand eight hours of use and abuse.

### 8 DIY Mask Materials Filtered More Than 45% of 0.3 Micron Particles



LUX-CFM



## FACE MASKS DURING A PANDEMIC



TD800

### THE RIGHT MASK FOR THE RIGHT RISK LEVELS (Continued)

#### LOW RISK ENVIRONMENTS:

In work environments that require little to no close proximity interaction with the public, it is likely that any face covering will do. Maintaining space becomes the important factor for protection, and the face covering is a precautionary measure. A maintenance worker or delivery driver, for example, would have very limited interaction with others, and a gaiter that can be quickly pulled up would be a great option for protection.

Not every worksite requires such a robust and rugged mask. In low risk work environments, likely outside in smaller numbers, with only casual momentary interaction, the use of a single-ply face covering is sufficient. In these scenarios, a properly worn gaiter will protect the workers from one another as they are not in close proximity, and the workers may be more likely to wear them as they are not only comfortable but can provide some wicking and cooling effects in warmer temperatures. Gaiters are also low-profile warmth in the winter. These types of face coverings, like our TD800 and TNG-FR neck gaiters, make it easy to raise and lower temporarily, to drink or take a quick bite. The same is true for face masks that utilize over-the-head and neck straps (vs behind the ear loops), like our LUX-CFM face mask.



TNG-FR





## FACE MASKS DURING A PANDEMIC

### HELPFUL RESOURCES

<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/about-face-coverings.html>

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>

<https://www.osha.gov/Publications/OSHA3990.pdf>

<https://www.astm.org/COVID-19/>

<https://abcnews.go.com/Health/scientists-test-face-covering-style-best-protects-coronavirus/story?id=71552469>

<https://www.huffpost.com/entry/best-coronavirus-face-mask-materials-new-study> | 5e99b576c5b6a92100e63129