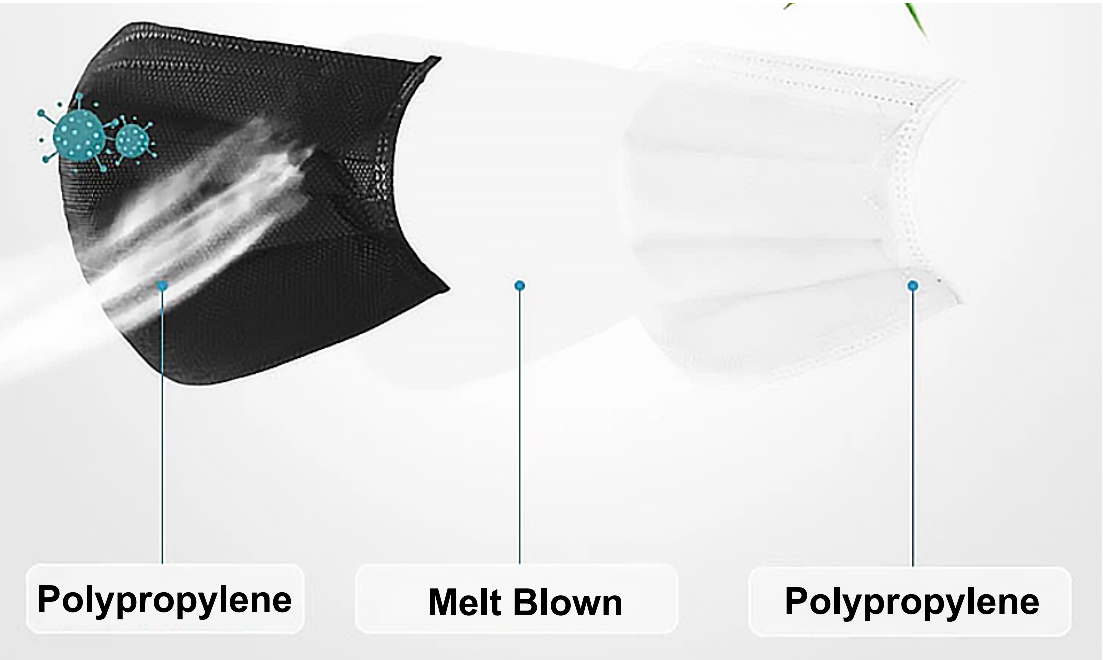
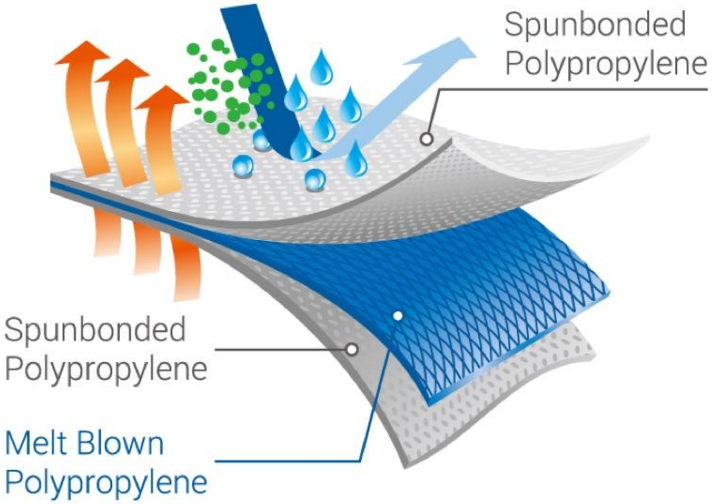
Why a surgical mask helps?

The structure of our mask



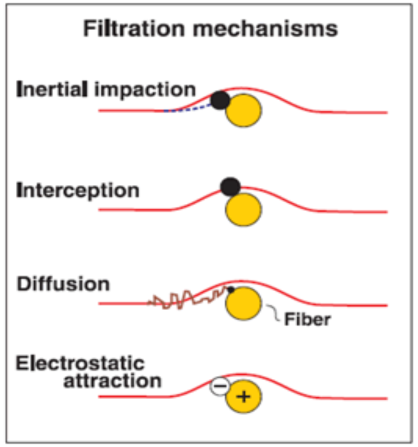


Filter Performance

The filters used in modern surgical masks and respirators are considered “fibrous” in nature—constructed from flat, nonwoven mats of fine fibers. Fiber diameter, porosity (the ratio of open space to fibers) and filter thickness all play a role in how well a filter collects particles. In all fibrous filters, three “mechanical” collection mechanisms operate to capture particles: inertial impaction, interception, and diffusion. Inertial impaction and interception are the mechanisms responsible for collecting larger particles, while diffusion is the mechanism responsible for collecting smaller particles. In some fibrous filters constructed from charged fibers, an additional mechanism of electrostatic attraction also operates. This mechanism aids in the collection of both larger and smaller particle sizes. This latter mechanism is very important to filtering facepiece respirator filters that meet the stringent NIOSH filter efficiency and breathing resistance requirements because it enhances particle collection without increasing breathing resistance.

How do filters collect particles?

These capture, or filtration, mechanisms are described as follows:



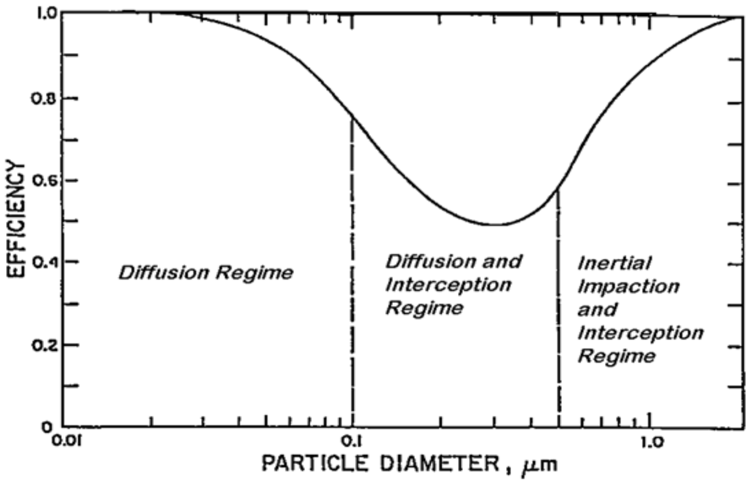


Figure 1: Filtration mechanisms

Inertial impaction: With this mechanism, particles having too much inertia due to size or mass cannot follow the airstream as it is diverted around a filter fiber. This mechanism is responsible for collecting larger particles.

Interception: As particles pass close to a filter fiber, they may be intercepted by the fiber. Again, this mechanism is responsible for collecting larger particles.

Diffusion: Small particles are constantly bombarded by air molecules, which causes them to deviate from the airstream and come into contact with a filter fiber. This mechanism is responsible for collecting smaller particles.

Electrostatic attraction: Oppositely charged particles are attracted to a charged fiber. This collection mechanism does not favor a certain particle size.

In all cases, once a particle comes in contact with a filter fiber, it is removed from the airstream and strongly held by molecular attractive forces. It is very difficult for such particles to be removed once they are collected. As seen in *Figure 2*, there is a particle size at which none of the “mechanical” collection mechanisms (interception, impaction, or diffusion) is particularly effective. This “most penetrating particle size” (MPPS) marks the best point at which to measure filter performance. If the filter demonstrates a high level of performance at the MPPS, then particles both smaller AND larger will be collected with even higher performance.

This is perhaps the most misunderstood aspect of filter performance and bears repeating. Filters do NOT act as sieves. One of the best tests of a filter’s performance involves measuring particle collection at its most penetrating particle size, which ensures better performance for larger and smaller particles. Further, the filter’s collection efficiency is a function of the size of the particles, and is not dependent on whether they are bioaerosols or inert particles.

No. 1 Non woven face mask

Bacteria filter effect following EN 14683

Nelson Labs
A Sotera Health company

Sponsor:
Walmart (China) Investment Co., Ltd.
2-5/F, Tower 2 and 1-12/F, Tower 3
SZITIC Square, 69 Nonglin Rd.
Shenzhen, Guangdong, 518000
CHINA

Bacterial Filtration Efficiency (BFE) and Differential Pressure (Delta P) Final Report

Test Article: Product Name: GV face mask
Purchase Order: 18C005S
Study Number: 1094375-S01
Study Received Date: 06 Sep 2018
Testing Facility: Nelson Laboratories, LLC
6280 S. Redwood Rd.
Salt Lake City, UT 84123 U.S.A.
Test Procedure(s): Standard Test Protocol (STP) Number: STP0004 Rev 15
Deviation(s): None

Summary: The BFE test is performed to determine the filtration efficiency of test articles by comparing the bacterial control counts upstream of the test article to the bacterial counts downstream. A suspension of *Staphylococcus aureus* was aerosolized using a nebulizer and delivered to the test article at a constant flow rate and fixed air pressure. The challenge delivery was maintained at 1.7 - 2.7 x 10^3 colony forming units (CFU) with a mean particle size (MPS) of 3.0 ± 0.3 μm. The aerosols were drawn through a six-stage, viable particle, Andersen sampler for collection. This test method complies with ASTM F2101-14, EN 14683:2014, Annex B, and AS4381:2015.

The Delta P test is performed to determine the breathability of test articles by measuring the differential air pressure on either side of the test article using a manometer, at a constant flow rate. The Delta P test was designed to comply with MIL-M-36954C, Section 4.4.1.2 and complies with EN 14683:2014, Annex C and AS4381:2015.

All test method acceptance criteria were met. Testing was performed in compliance with US FDA good manufacturing practice (GMP) regulations 21 CFR Parts 210, 211 and 820.

Test Side: Inside
BFE Test Area: ~40 cm^2
BFE Flow Rate: 28.3 Liters per minute (L/min)
Delta P Flow Rate: 8 L/min
Conditioning Parameters: 85 ± 5% relative humidity (RH) and 21 ± 5°C for a minimum of 4 hours
Test Article Dimensions: ~174 mm x ~158 mm
Positive Control Average: 2.6 x 10^3 CFU
Negative Monitor Count: <1 CFU
MPS: 3.1 μm

ilac-MRA ANAB ACCREDITED TESTING LABORATORY

For
Study Director Janelle R. Bentz, M.S.

24 SEP 2018
Study Completion Date

1094375-S01

Nelson Labs
A Sotera Health company

Results:

Test Article Number	Percent BFE (%)	Delta P (mm H_2O/cm^2)	Delta P (Pa/cm^2)
1	>99.9	3.3	32.2
2	>99.9	3.5	33.9
3	99.9	3.7	36.1
4	99.8	3.1	30.1
5	99.8	3.2	31.6

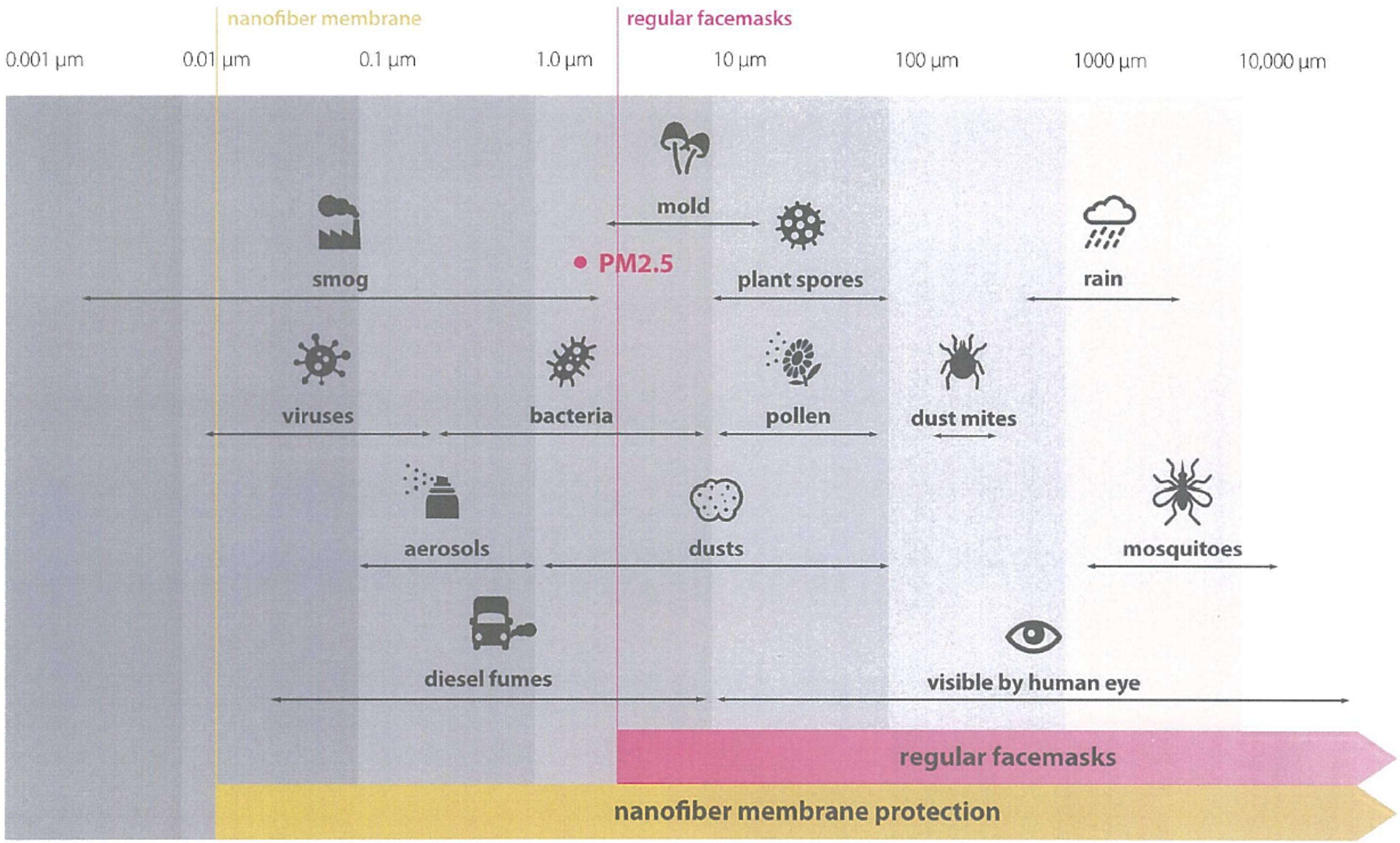
The filtration efficiency percentages were calculated using the following equation:

$$\% BFE = \frac{C - T}{C} x\, 100$$

C = Positive control average
T = Plate count total recovered downstream of the test article
Note: The plate count total is available upon request

We guarantee BFE ≥95%

Viruses must be attached to bacteria



A **virus** is a small **infectious agent** that replicates only inside the living **cells** of other **organisms**. Viruses can infect all types of life forms, from **animals** and **plants** to **microorganisms**, including **bacteria** and **archaea**.[1]

From---https://encyclopedia.thefreedictionary.com/droplet+infection

Introduction by WHO (World Health Organization)

Rational use of personal protective equipment for coronavirus disease 2019 (COVID-19)

Interim guidance
27 February 2020

World Health Organization

Coronavirus disease 2019 (COVID-19), caused by the COVID-19 virus, was first detected in Wuhan, China, in December 2019. On 30 January 2020, the WHO Director-General declared that the current outbreak constituted a public health emergency of international concern.

This document summarizes WHO's recommendations for the rational use of personal protective equipment (PPE) in healthcare and community settings, as well as during the handling of cargo; in this context, PPE includes gloves, medical masks, goggles or a face shield, and gowns, as well as for specific procedures, respirators (i.e., N95 or FFP2 standard or equivalent) and aprons. This document is intended for those who are involved in distributing and managing PPE, as well as public health authorities and individuals in healthcare and community settings, and it aims to provide information about when PPE use is most appropriate.

WHO will continue to update these recommendations as new information becomes available.

Preventive measures for COVID-19 disease

Based on the available evidence, the COVID-19 virus is transmitted between people through close contact and droplets, not by airborne transmission. The people most at risk of infection are those who are in close contact with a COVID-19 patient or who care for COVID-19 patients.

Preventive and mitigation measures are key in both healthcare and community settings. The most effective preventive measures in the community include:

- performing hand hygiene frequently with an alcohol-based hand rub if your hands are not visibly dirty or with soap and water if hands are dirty;
- avoiding touching your eyes, nose and mouth;
- practicing respiratory hygiene by coughing or sneezing into a bent elbow or tissue and then immediately disposing of the tissue;
- wearing a medical mask if you have respiratory symptoms and performing hand hygiene after disposing of the mask;
- maintaining social distance (a minimum of 1 m) from individuals with respiratory symptoms.

Additional precautions are required by healthcare workers to protect themselves and prevent transmission in the healthcare setting. Precautions to be implemented by healthcare workers caring for patients with COVID-19 disease include using PPE appropriately; this involves selecting the proper PPE and being trained in how to put on, remove and dispose of it.

PPE is only one effective measure within a package that comprises administrative and environmental and engineering controls, as described in WHO's *Infection prevention and control of epidemic- and pandemic-prone acute respiratory infections in health care* (*1*). These controls are summarized here.

- **Administrative controls** include ensuring the availability of resources for infection prevention and control measures, such as appropriate infrastructure, the development of clear infection prevention and control policies, facilitated access to laboratory testing, appropriate triage and placement of patients, adequate staff-to-patient ratios and training of staff.
- **Environmental and engineering controls** aim at reducing the spread of pathogens and reducing the contamination of surfaces and inanimate objects. They include providing adequate space to allow social distance of at least 1 m to be maintained between patients and between patients and healthcare workers and ensuring the availability of well-ventilated isolation rooms for patients with suspected or confirmed COVID-19 disease.

COVID-19 is a respiratory disease that is different from Ebola virus disease, which is transmitted through infected bodily fluids. Due to these differences in transmission, the PPE requirements for COVID-19 are different from those required for Ebola virus disease. Specifically, coveralls (sometimes called Ebola PPE) are not required when managing COVID-19 patients.

Disruptions in the global supply chain of PPE

The current global stockpile of PPE is insufficient, particularly for medical masks and respirators; the supply of gowns and goggles is soon expected to be insufficient also. Surging global demand – driven not only by the number of COVID-19 cases but also by misinformation, panic buying and stockpiling – will result in further shortages of PPE globally. The capacity to expand PPE production is limited, and the current demand for respirators and masks cannot be met, especially if the widespread, inappropriate use of PPE continues.

Special considerations for rapid response teams assisting with public health investigations[d]			
Community			
Anywhere	Rapid response team investigators.	Interview suspected or confirmed COVID-19 patients or their contacts.	No PPE if done remotely (e.g., by telephone or video conference). Remote interview is the preferred method.
		In-person interview of suspected or confirmed COVID-19 patients without direct contact.	Medical mask Maintain spatial distance of at least 1 m. The interview should be conducted outside the house or outdoors, and confirmed or suspected COVID-19 patients should wear a medical mask if tolerated.
		In-person interview with asymptomatic contacts of COVID-19 patients.	Maintain spatial distance of at least 1 m. No PPE required The interview should be performed outside the house or outdoors. If it is necessary to enter the household environment, use a thermal imaging camera to confirm that the individual does not have a fever, maintain spatial distance of at least 1 m and do not touch anything in the household environment.

Introduction by WHO (World Health Organization)

https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/when-and-how-to-use-masks

Coronavirus disease (COVID-19) advice for the public: When and how to use masks

Graid Medical Mask to protect you from Novel Coronavirus!

The end!

Thank you!