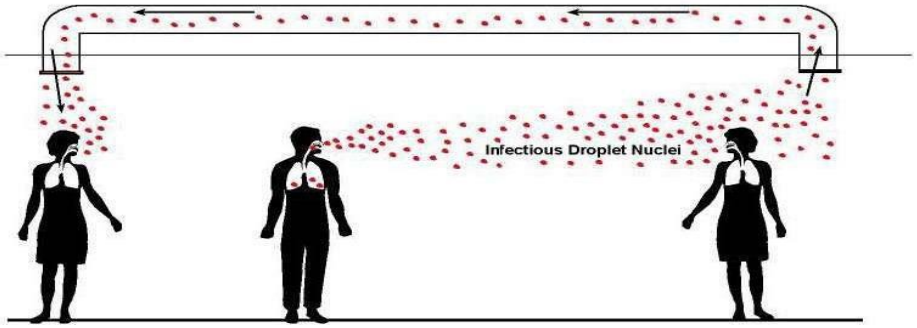
Trinks Consulting GROUP

Sanders™ Filter Materials

A new and unique method to help contain and remove particles, the size of known pathogens from your facilities.



Containment Filter

by Sanders, Inc.

For the first time, allows for HEPA or near HEPA air filtration without the need for a retro fit of the HVAC system or holding frame.

Our filter is a soft, flexible pad with a very low static pressure, unlike rigid micro-fine glass HEPA filters.

"Sanders is manufacturing the highest-quality synthetic filters in the industry."

Immediate Submicron Air Filtration

Sanders Containment Filters are now available to greatly enhance our ability to contain the spread of respiratory viruses. The Containment Filter can and should be utilized immediately after an outbreak is recognized.

The Sanders Containment Filter is not solely for viral pandemics. It also has the potential to be unbelievably helpful in hospital waiting areas, outpatient clinics, extended care sites, residential care sites, community-based outpatient clinics, other healthcare centers, as well as schools, airports, ships, warehouses, offices, municipalities, or any indoor workspace that could possibly become a source where influenza and other airborne diseases are spread throughout the interior of your facilities.

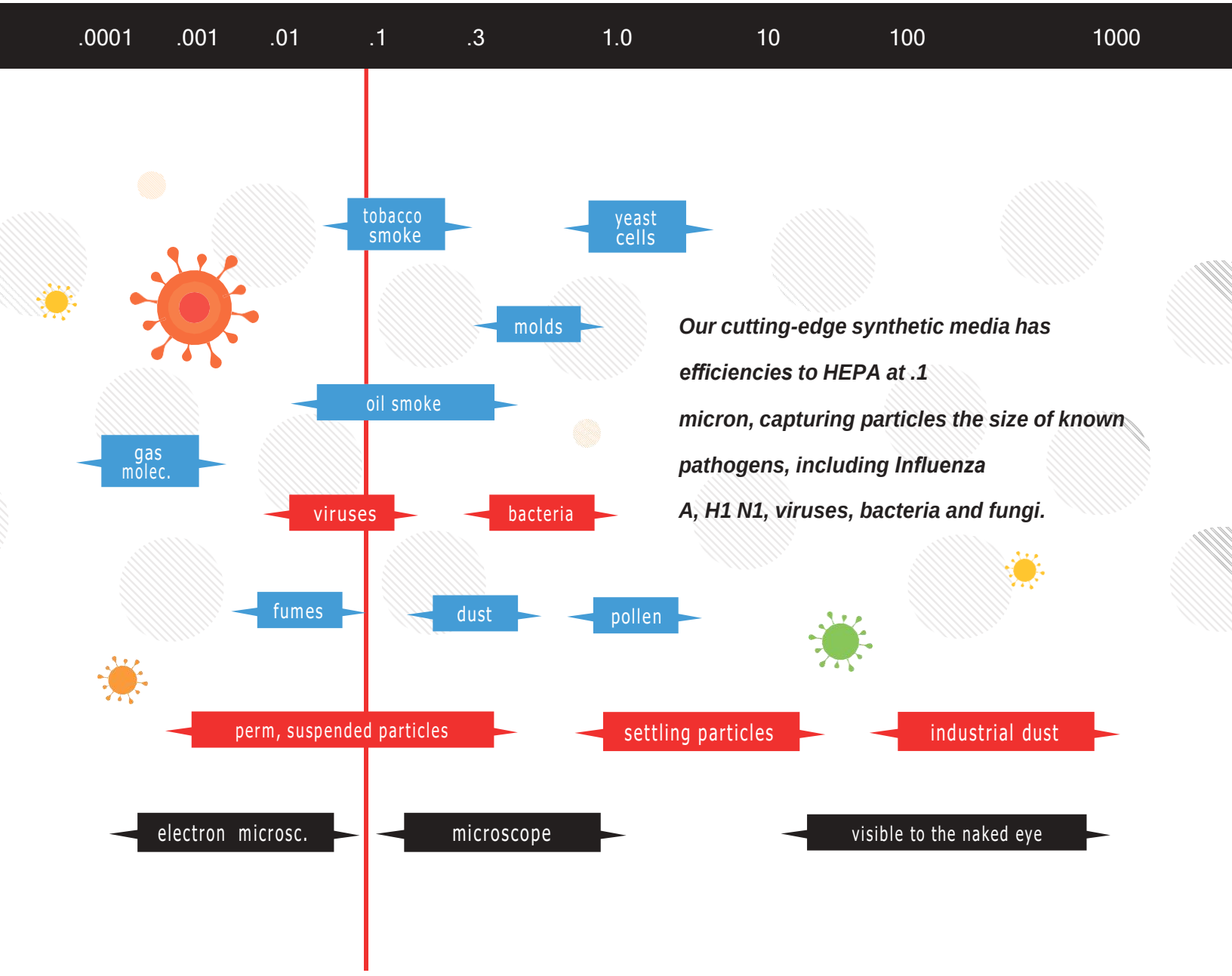
Sanders Inc offers two different types of temporary air filtration solutions in addition to our long-term HVAC Total Protection System (TPS):

The Sanders Air Mover System (AMS)

The Sanders Drape and Tape System (DTS)

AIR CONTAMINANTS

[relative particle size in microns]



Our cutting-edge synthetic media has efficiencies to HEPA at .1 micron, capturing particles the size of known pathogens, including Influenza A, H1 N1, viruses, bacteria and fungi.

November 4, 2015

FLOOR DRYER TEST RESULTS SANDERS 100 SERIES CONTAINMENT FILTER MEDIA, 8" ROUND X 2, ON A 600 CFM FLOOR DRYER

TIME OF READING:

[numbers represent submicron particles per liter of air]

	1:30 PM	2:30 PM	3:30 PM	4:30 PM
LEFT-BACK CORNER	51,500	12,600	4,600	4,600
RIGHT-BACK CORNER	52,000	12,300	6,600	6,300
LEFT-FRONT CORNER	56,100	12,300	8,100	5,100
RIGHT-FRONT CORNER	56,100	12,800	7,100	6,100
CENTER OF ROOM	56,000	11,300	8,100	7,800
AVERAGE	54,300	12,260	6,900	5,980

RESULTS: 89% REDUCTION IN SUBMICRON PARTICLES

How do I use my Sanders Air Mover System?

Where do I place my AMS? We recommend placing your Sanders AMS in a back closet or back corner of a room and turn it, so the fan is facing toward the ceiling. We do this because, this disburses the particles up toward the ceiling and down the wall returning it against the floor. This provides maximum filtration and scrubs the air contained within that room. Our AMS aids your HVAC system, but your HVAC system will also spread the freshly filtered air. Preview Sanders Filters video here (5 mins).

The Sanders AMS

These small 800 CFM units are perfect for providing submicron filtration in any environment. Our Sanders AMS is portable and convenient to provide submicron filtration in any room at your facilities without modifying your HVAC system.

Portable Submicron Air Filtration

With our AMS system you can truly have submicron filtration anywhere without touching your HVAC system. These portable air movers are 800 CFM and have 3-speeds.

One (1) Sanders AMS can successfully filter a 3,000 squarefoot area. By cutting the flat cut pad into 8" circles you are able to experience on-demand air filtration that enhances your air changes and provides additional ventilation.

How do I use the Sanders Drape and Tape System?

Our DTS, is the perfect solution for all large facilities that need submicron filtration quickly! Whether it is to open your school, business, childcare center, or establishment, our flexible flat-cut pad filters are able to be simply placed over your standard pleated filter and used immediately.

The Sanders DTS

Since our material is a flat cut pad, it can be placed over your current basic pleated filter. By simply cutting out the middle of your pleated filter it creates a temporary frame while an IAQ survey is conducted of your facility, allowing us time to install a permanent TPS Frame in your HVAC system.

Quick and easy application

Simply cut out the inside of your current filter, and that current filter now becomes a useable frame for ourSanders Containment Filter. Use double-sided tape to apply our material and place it back inside your HVAC unit. We are able to provide submicron filtration for nearly any HVAC system.

How do I apply the Sanders Filter Material to the existing HVAC air filter frame?

Step 1
Cut all but one inch out of your current pleated filter. If using a different type of filter than a pleated filter, that is okay as this is a temporary solution. Just cut the inside of your current filter leaving only a frame.

Step 2
Using the material we send you, cut the material the size of the existing frame + one inch on each side. So, if your filter is 20x20, cut the material 21x21.

Step 3
Apply double-sided tape to all edges of your new frame. Then beginning with any side, apply the material around the edges. Be sure to pull it as taught as possible.

How often do I change my Sanders Filters?

Our filters are supposed to turn dark. It demonstrates that they are working. We encourage you to change the filters on average every 90 days when your filters look like this:

[Need to be changed]

[Should be changed]

Sanders Particulate Containment Air Filters - FAQ

Why was this new medical-grade particulate containment air filtration system developed?

Nosocomial diseases are spread throughout facilities in part by the mixing action of the HVAC system. This allows contaminated air in one room to be dispersed throughout all rooms served by the same air handler, in effect spreading pathogens from a single infected room to all rooms on the same system. The Sanders Inc. Particulate Containment Filter eliminates the problem of particles the size of known pathogens being spread by this mixing action of the HVAC system.

Why place the particulate containment filters over the return vent?

The filter attached to the return vent prevents the pathogen from entering the HVAC system through the return vent. Preventing any possibility of it being spread to other rooms on the same HVAC system. The pathogen is thereby contained to only the original room where the release occurred. This process not only prevents the pathogen from entering the HVAC system the particulate containment filter also captures and holds most of the pathogens at or near HEPA efficiencies, as they were about to enter the system, removing them from the air. Once the filters are installed, this process is automatic and continuous every hour of every day, straining the air and diluting the total quantity of pathogens in the air throughout the facility.

How do the particulate containment filters placed over the return vents affect air flow?

In the past, commercial building return vents have not been filtered, and especially not at HEPA or near-HEPA filtration. The particulate containment filters utilize a very specialized media specifically designed to provide extremely low static pressure, while maintaining HEPA or near-HEPA efficiencies. Even with this low static pressure media, the concept of placing any filters over the return vent seems foreign to the way we have done things in the past. It is logical that you would assume it could cause a problem with the air flow and thereby the necessary heating and cooling function of the HVAC system. Return air is not forced under pressure, as is the supply side. The return air is moved by the vacuum created as the supply side air is pushed from the blower to the building. The vacuum creates suction, and this suction moves the air on the return side to fill this void. This process still occurs after the containment filters are placed over the return vents.

Could the containment filters reduce the return air flow and cause the HVAC system to fail?

The particulate containment filters must be placed over all return vents when used. This provides for a uniform increase in static pressure throughout the entire system, allowing the return vents to still be balanced. All commercial systems are designed with and require Make-Up Air Dampers to replace air that exits the building by the normal process as people enter and leave the building. This is normally 10% make-up air. This damper can be opened to allow more outside air into the system decreasing the vacuum or be closed to create more suction in the return side of the system. The additional resistance created after installing the filters on the return side will increase the face velocity of the air at the damper and should be inspected to verify the proper air flow at the damper, after installation of the filters is completed. This should be verified by the return side Magnahelic press reading. The damper can be adjusted open or closed to correct any imbalance. This adjustment should be done under the direction of your engineering staff or facilities manager and should easily correct any imbalance.

What if adjusting the Make-Up Damper does not correct the imbalance in my system?

Your building may not have a blower or fan with sufficient force to overcome this additional resistance. The medical-grade containment filters are also available in a lower weight, less restrictive media, at a slightly lower initial efficiency, and may be used throughout non-commercial facilities, recreational vehicles, boats, and residences.

How would the particulate containment filter help if used for Bio-terrorism prevention?

In the event of a terrorist attack their goal will be to disperse the chemical agent or pathogen as quickly as possible throughout as much of the building, as fast as they can. After the release occurs, the terrorists will rely on the HVAC system to assist with the dispersal. Any release of chemical agents or pathogens submicron in size will move with the air current throughout the common areas and hallways where the release occurs. Many of these chemical agents or pathogens are submicron in size and would be picked up by the HVAC system that would act as a mixer, spreading the particles to other rooms and throughout the rest of the wing served by the same HVAC system. The medical-grade containment filter will all but stop this process by containing the pathogens to the release area only, providing time for personnel to exit other parts of the building. The medical -grade containment filter will also immediately begin diluting the release area of pathogens as they are drawn into the media over the return of the HVAC system, holding and removing them from the air. In this manner the HVAC system now helps to prevent the spread of pathogens instead of aiding in the dispersal.

What information do I need to place an order?

Sanders Particulate Containment Air Filters are provided as standard HVAC size precut pads with the self-stick adhesive already attached, or as bulk rolls for non -standard sizes with the adhesive sold separately in rolls. To expedite the process, you to need provide an ODxOD list of necessary return vent sizes with the number of sizes requested. Please keep in mind this survey should be categorized by wing or floor so installation can be easily accomplished later. For systems with non-standard or metric, the surveys are easily accomplished again by ODxOD measurements. Add all measurements with 15% scrap. The bulk rolls are provided at 1,075 square foot rolls.

How do I install the medical-grade containment filters?

Sanders Inc. has a separate installation instruction sheet. TPS gasketed frames are also available for a simple cost-effective solution. Please contact your local Sanders Inc. Authorized Distributor. They will be more than happy to provide that information for you.

How often do the medical-grade containment filters need to be replaced?

The particulate containment media is capable of filtering most particles from the air to as small as submicron in size. This means the media is collecting and trapping particles much smaller than the human eye can see and larger. Because of the efficiencies it will surface load quickly. The estimated change is 90 days or less for commercial buildings. The best way to gauge the change schedule is daily monitoring of the Magnahelic pressure on the return side. Once the pressure starts to rise, they will load quickly and need to be changed. After monitoring this change schedule with the first set of filters the change schedule should remain similar, unless the conditions within your facilities change.

What actual efficiencies should I receive from the filters in my building?

The media used in the medical grade containment filters is available in (5) different weights that are rated at initial efficiencies from 86% to 99.97% @ 0.1 micron. We say "to" 99.97% because the efficiencies can vary or be reduced with higher air flow velocities in some return systems. Return HVAC systems can vary in this face velocity from vent- to-vent and system -to-system within the same building. This is due to the design parameters of each individual system. If the face velocity goes beyond the rated flow, the media may drop below 99.97% efficiency.

Please keep in mind 99.97% @ 0.3 micron filtration allows for only 3/10th of 1% of the submicron particles to pass through the media with a single pass of air. Even if, on your system the efficiencies of the containment filters are reduced to 99% or 98% @ 0.3 micron, this reduced efficiency would still be very effective at stopping, holding and trapping particles of this submicron size. Even this reduced efficiency would allow only 1-2% of the total particle matter through the media. The CDC currently recommends N-95 respirators that are rated 95% efficiency @ 0.3 micron as sufficient protection for personal respirators for healthcare professionals treating H1N1 patients.

NELSON
LABORATORIES

FINAL REPORT

BACTERIAL FILTRATION EFFICIENCY TEST (BFE) AT AN INCREASED CHALLENGE LEVEL

LABORATORY NO. 286732

PREPARED FOR:

Sanders Inc.

SUBMITTED BY:

NELSON LABORATORIES, INC.
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NELSON
LABORATORIES

BACTERIAL FILTRATION EFFICIENCY
TEST (BFE) AT AN INCREASED
CHALLENGE LEVEL

LABORATORY NUMBER: PROCEDURE NUMBER: SAMPLE SOURCE: SAMPLE IDENTIFICATION: DEVIATIONS:
DATA ARCHIVE LOCATION: SAMPLE RECEIVED DATE: LAB PHASE START DATE:
LAB PHASE COMPLETION DATE: REPORT ISSUE DATE:
TOTAL NUMBER OF PAGES:

Sanders Inc. Refer to Table 1
None

REFERENCE:

MIL-M-36954C. 1975. Headquarters, Defense Personnel Support Center, Philadelphia, PA.

Andersen 2000 Inc. 1976. Viable (Microbial) Particle Sizing Samplers Operating Manual. Andersen 2000 Inc., Atlanta, GA.

ACCEPTANCE CRITERIA:

The mean particle size of the challenge aerosol must be maintained at 3.0 ± 0.3 μm.

The average % BFE for the reference material must be within the upper and lower control limits established for the BFE test.

INTRODUCTION:

This report describes the procedure and results of the bacterial filtration efficiency (BFE) at increased challenge level testing. This procedure was performed to determine the filtration efficiency of the test materials using a ratio of the challenge to effluent to determine percent efficiency. This procedure allowed a reproducible aerosol challenge to be delivered to each of the test materials. This test procedure employed a challenge level of greater than 10^6 colony forming units (CFU) per test sample, providing a higher challenge than would be expected in normal use.

JUSTIFICATION:

This BFE test provides a number of advantages over other filtration efficiency tests. The use of all glass impingers (AGIs) in the collection process allowed a high concentration of challenge to be delivered to each test material. The aerosol challenge particle size can be tightly controlled by monitoring the airflow and challenge flow through the nebulizer. The aerosol particles can be sized using a six-stage viable particle Andersen sampler.

PROCEDURE:

Approximately 100 mlof soybean casein digest broth (SCDB) was inoculated with *Staphylococcus aureus,* ATCC #6538, and incubated with mild shaking for 24 ± 4 hours at 37 ± 2°C. The culture suspension was pumped through a 'Chicago' nebulizer using a peristaltic pump at a controlled flow rate and fixed air pressure. The constant challenge delivery formed aerosol droplets of defined size. The challenge level was adjusted to provide a consistent challenge of greater than 10^6 CFU per test sample.

The droplets were generated in a glass aerosol chamber and drawn through the sample holder and into AG Is in parallel. The AGIs contained 30 ml aliquots of sterile peptone water to collect the aerosol droplets. The aerosol challenge flow rate through the test filter was maintained at 30 Lpm.

The challenge was delivered for a 1-minute interval and sampling through the AG Is was conducted for 2 minutes to clear the aerosol chamber. Control runs (no media in sample holder) were performed after every 5-7 test samples to determine the number of viable particles beinggenerated in the challenge aerosol.

The assay fluid in the AGIs was assayed using standard plate count or membrane filtration techniques. All plates were incubated at 37 ± 2°C for 48 ± 4 hours prior to counting.

STATEMENT OF UNCERTAINTY:

Due to the large number of data points available for the standard reference material used in the BFE test, the Type B uncertainty factors have been determined to be incorporated into the Type A uncertainty. The combined uncertainty and expanded uncertainty for the BFE test are calculated as follows:

Statistical analysis of the BFE data resulted in the following:

Mean Bacterial Filtration Efficiency = 99.98%
Standard Deviation = 0.0016%

The combined standard uncertainty for the BFE test is 0.0016%BFE and the expanded uncertainty at a 95% confidence level is 0.003%BFE.

It should be noted that the statistical analysis was conducted on data from Nelson Laboratories' standard reference material with a mean BFE of 99.98%. It is expected that materials submitted for BFE testing which have a %BFE lower than 99.98 would have a combined uncertainty and an expanded uncertainty greater than the uncertainty values reported here. Conversely, test materials with %BFE values greater than 99.98 would be expected to yield a combined uncertainty and an expanded uncertainty less than the uncertainty values reported here.

RESULTS:

The filtration efficiencies were calculated using the following equation:

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

Where: C ;:: Average of control values.
T ;:: Count total for test material.

The mean particle size (MPS) of the challenge aerosol was determined using a six-stage Andersen sampler. The challenge level, MPS, and filtration efficiencies of the samples are summarized in Table 1.

TABLE 1. BFE Results
Sanders's series 150 With 17 g/m^2 Cover Web Both Sides,

SAMPLE IDENTIFICATION	TOTAL CFU RECOVERED	FILTRATION EFFICIENCY
150/15 PPCW-2 #1	16	99.99971%
150/15 PPCW-2 #2	11	99.99980%
150/15 PPCW-2 #3	10	99.99982%

Challenge Level: 5.6 x 10^6

CFU Mean Particle Size

(MPS): 3.0 μm

Sanders Filters Inc.

TECHNICAL DATA SHEET

PRODUCT ID: *Sanders 250 Series testing*

TECHNICAL DATA	WEIGHT	COLOR	MATERIAL COMPOSITION
Sander 250	250 g/m^2	WHITE	BLENDED SYNTHETIC FIBER
SCRIM	15 g/m^2	WHITE	SPUNBOND POLYPROPYLENE *(other colors available)*
NETTING	180 g/m^2	CLEAR	
TOTAL MEDIA WEIGHT	445 g/m^2		
AVAILABLE FORMS	SINGLE OR DOUBLE LAMINATED SCRIM / MELTBLOWN MEDIA ROLLS, SHEETS, COILS (SLIT TO WIDTH) & FABRICATED PARTS (INCLUDING HEAT SEALED OR WELDED)		

FILTRATION PERFORMANCE		
NaCl Penetration at 32 LPM	< 0.50%	*Tested in accordance to TSI8130 NaCl 0.1 micron particle size*
NaCl Efficiency at 32 LPM	> 99.50%	*Tested in accordance to TSI8130 NaCl 0.1 micron particle size*
Pressure Drop at 32 LPM	< 1.6 mm H_2O	*Tested in accordance to TSI8130 NaCl 0.1 micron particle size*
BFE Efficiency	> 99.99995%	*Tested in accordance to Spec MIL-M-36954C By Nelson Labs*
VFE Efficiency	> 99.99980%	*Tested in accordance to Spec MIL-M-36954C By Nelson Labs*
Air Permeability**	> 85 CFM	*Tested in accordance to ASTM Spec ASTM D373*

TESTING APPARATUS / SAMPLE SIZE:

***RIG:** TS18130 AUTOMATED LASER PARTICLE COUNTER

SAMPLE SIZE: 100 cm^2

****RIG:** TEXTEST FX3300 AIR PEREABILITY TESTER