

# NANO FILTER MASK

**Electrospun Ultrafine Fiber Web**

Pacific Rim Components Corp.

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# NANO FILTER Professional Mask - Product Description

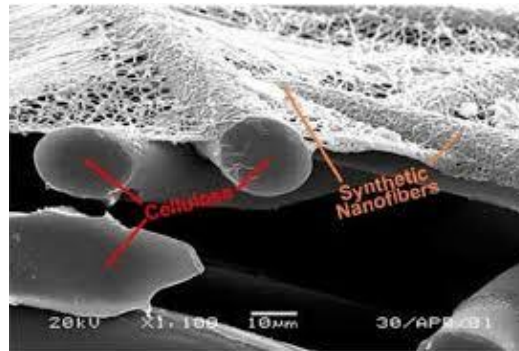
## Electrospun Nanofiber Filter Media:

0.2~ 0.4 $\mu$ m fiber thickness and 0.4~ 0.5 $\mu$ m microporous web

Polymer in PVDF (Polyvinylidene fluoride) 0.5gsm  
 PET Nonwoven Substrate 30gsm  
 Hydrophobic characteristic

## Appearance

White nonwoven fabric mask with a nose wire on the 3 stage transverse folding body and white strings and connecting rings on both side



# NANO QUEEN MASK

Structure	Description	Materials
Layer 1	Outer Fabric	Polypropylene Sponbond Nonwoven
Layer 2	Nanofiber Filter	PET (98.4%) + PVDF (1.6%) Nonwoven
Layer 3	Inner Fabric	Polypropylene Sponbond Nonwoven
Accessory 1	Nose Band	Polyphyllene Coated Wire
Accessory 2	Earring	Nylon (60%) + Spandex (40%)
Accessory 3	Holder for Band	Polypropylene



## COMPARISON CHART (N95 vs KF94 vs Nano Queen)

Comparative Description	N95	KF94	Nano Queen
Filter Efficiency – must be $\geq x\%$	$\geq 95\%$	$\geq 94\%$	$\geq 98\%$
Target agent	NaCL	NaCL and parafin Oil	NaCL and parafin Oil
Flow rate	85 L/min	95 L/min	
Total inward leakage (TIL)	N/A	$\leq 8\%$ leakage (arithmetic mean)	2.5% leakage
Inhalation resistance - max pressure drop rate	$\leq 343$ Pa	$\leq 70$ Pa (at 30 L/min) $\leq 240$ Pa (at 95 L/min)	$\leq 33$ Pa (at 30 L/min) $\leq 112$ Pa (at 95 L/min)
Flow rate	85 L/min	Varied	
Exhalation resistance - max pressure drop rate	$\leq 245$ Pa	$\leq 300$ Pa	$\leq 112$ Pa
Flow rate	85 L/min	160 L/min	

## Additional Nelson Lab Test Results

### Bacterial Filtration Efficiency (BFE) Report

Total Article Number	Percent BFE(%)
1	>99.9
2	>99.9
3	>99.9

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

Total Article Number	Percent BFE(%)
1	>99.9 <sup>a</sup>
2	>99.9 <sup>a</sup>
3	>99.9 <sup>a</sup>

### Bacterial Filtration Efficiency (BFE) at an Increased Challenge Level Report

Total Article Number	Total CFU Recovered	Filtration Efficiency (%)
1	$4.9 \times 10^2$	99.986
2	$5.4 \times 10^2$	99.984
3	$3.2 \times 10^2$	99.9903

## Additional Nelson Lab Test Results

### Viral Filtration Efficiency (VFE) Report

Total Article Number	Percent VFE(%)
1	>99.9
2	>99.9
3	>99.9

### Viral Filtration Efficiency (VFE) at an Increased Challenge Level Report

Total Article Number	Total CFU Recovered	Filtration Efficiency (%)
1	$5.3 \times 10^2$	99.76
2	$5.4 \times 10^2$	99.75
3	$4.2 \times 10^2$	99.981

### Latex Particle Challenge Report

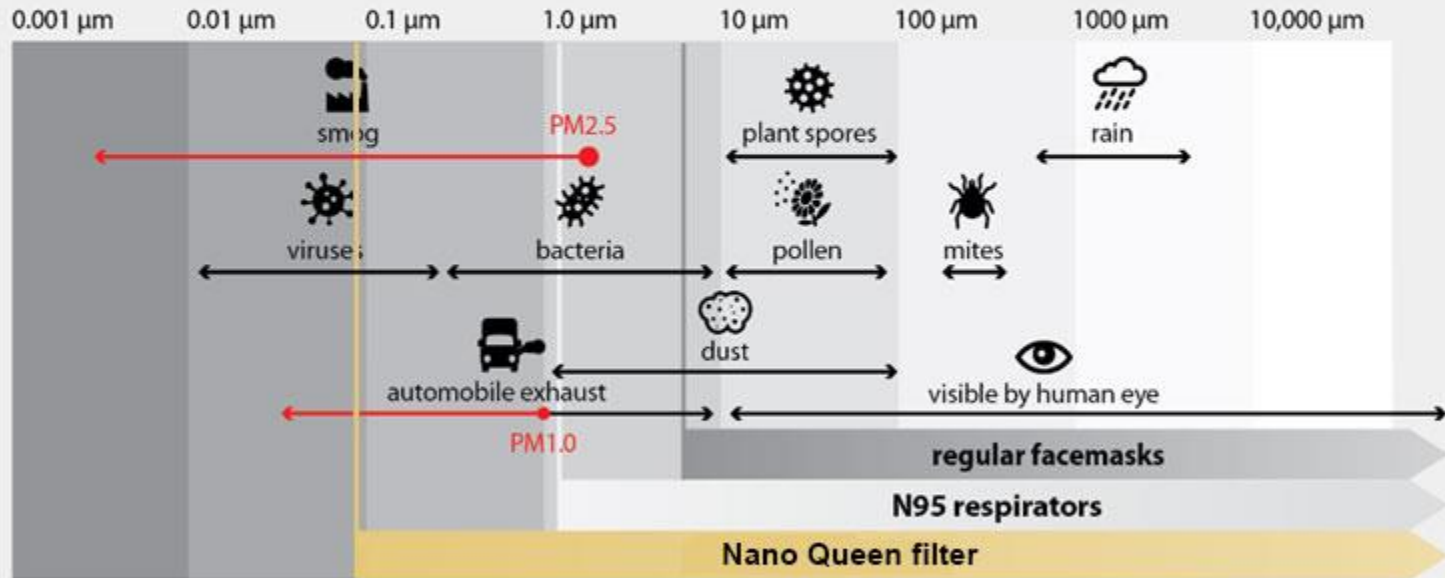
Particle Size 0.1  $\mu\text{m}$

Test Article Number	Test Article Counts	Average Control Counts	Filtration Efficiency (%)
1	176	11.395	98.5
2	332	12.283	97.3
3	173	12.078	98.6

# NANOFIBER FILTER

Nano Queen

## Particles datched by Nano Queen filter



On the graph above see what dangerous particles are you protected from wearing Filtration Halfmask.

# NANOFIBER FILTER

- Electrospun type Nanofiber Filter Media
- 0.1~0.3 $\mu\text{m}$  fiber thickness (500 times thinner than human hair)
- 0.1~0.2 $\mu\text{m}$  Micropore size
- Narrow pore size distribution rate
- Over 80% of porosity
- Excellent air permeability
- Excellent water, particle and microbial protection
- 100% Open cell structure



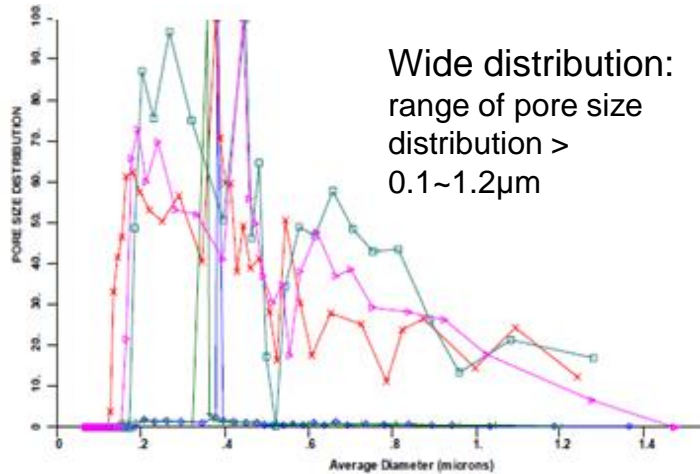
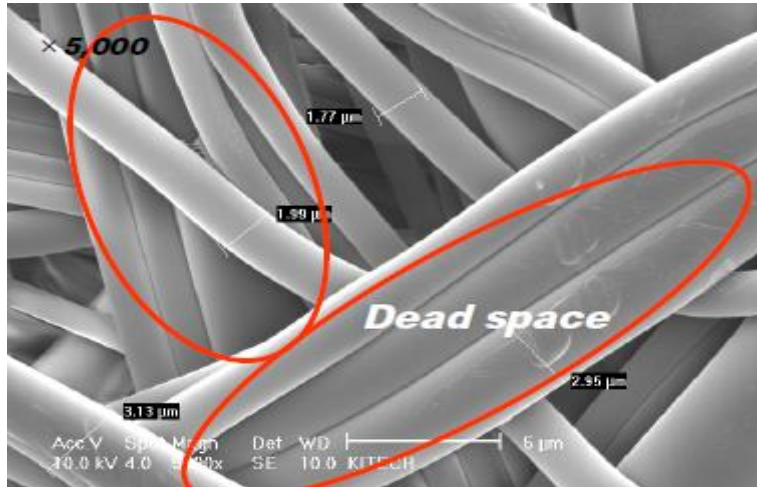
## Specification

Physical Property	Value	Unit	Remark	Test Method
Total Basic Weight	30.8	g/m <sup>2</sup>		ASTM D 3776
Air permeability	20.1	cfm	125Pa	ASTM D 737
Efficiency	96.98	%	NaCl , 32L/min	ASTM D 2986
Pressure drop	7.4	mmH <sub>2</sub> O		ASTM D 2986
Color	White			

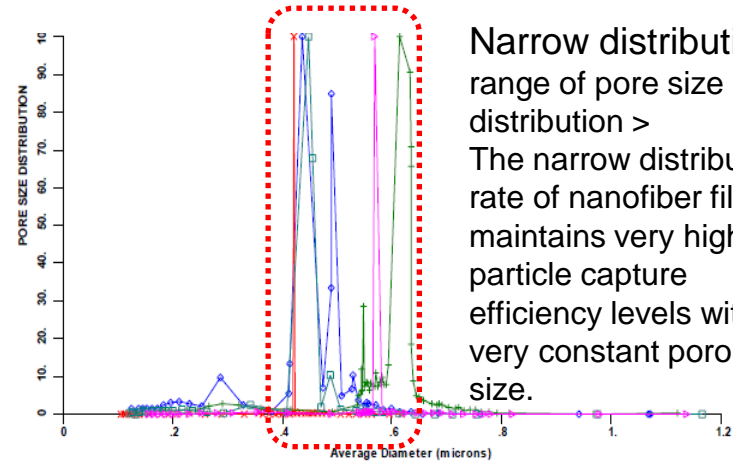
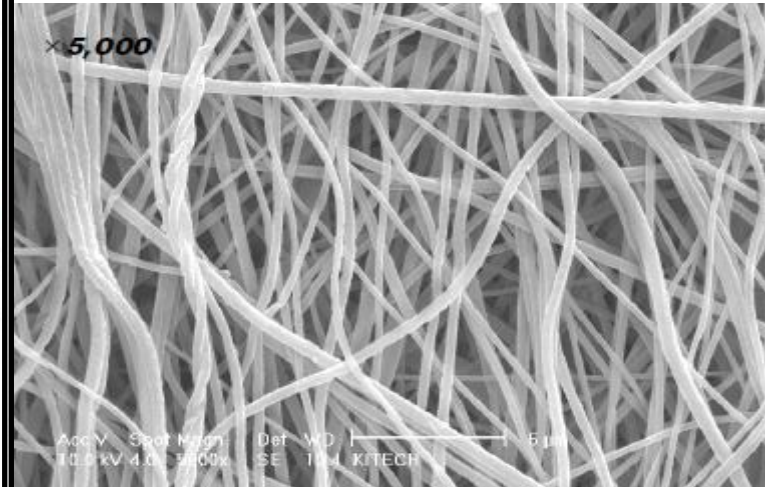


## Comparison example of porosity & pore size distribution

A company.  
Diameter of fiber : 1~ 3 $\mu$ m  
Porosity : 20~ 35%



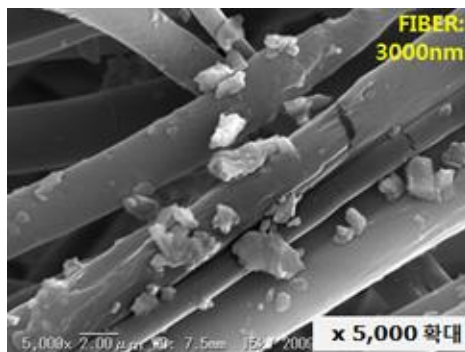
**NANO QUEEN Nanofiber**  
Diameter of fiber : 0.5 $\mu$ m  
Porosity : 80~ 85%



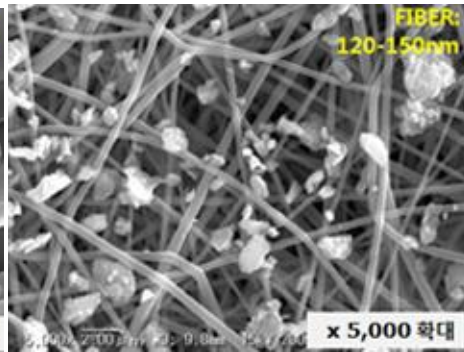
# NANOFIBER FILTER

Nano Queen nanofiber filter mask has a large air non-surface area, making it easy to breathe, and it is a technology that produces excellent filter performance that filters out PM2.5 ultra-fine dust. Conventional electrostatic filter masks reduce filter efficiency after electric discharge, but nano-fiber filter masks provide stable, high-efficiency filtering performance regardless of external environment.

Classification	Pamaceutical Mask	Nano Queen Mask
Production Type	Melt Blown Type	Electrospun Type
Characteristics	Electrostatic filter power makes it more efficient in the beginning, but rapidly decreases as static electricity is lost according to usage time.	Electricity is unaffected, maintaining continuous high efficiency due to the structural form of the fiber itself.



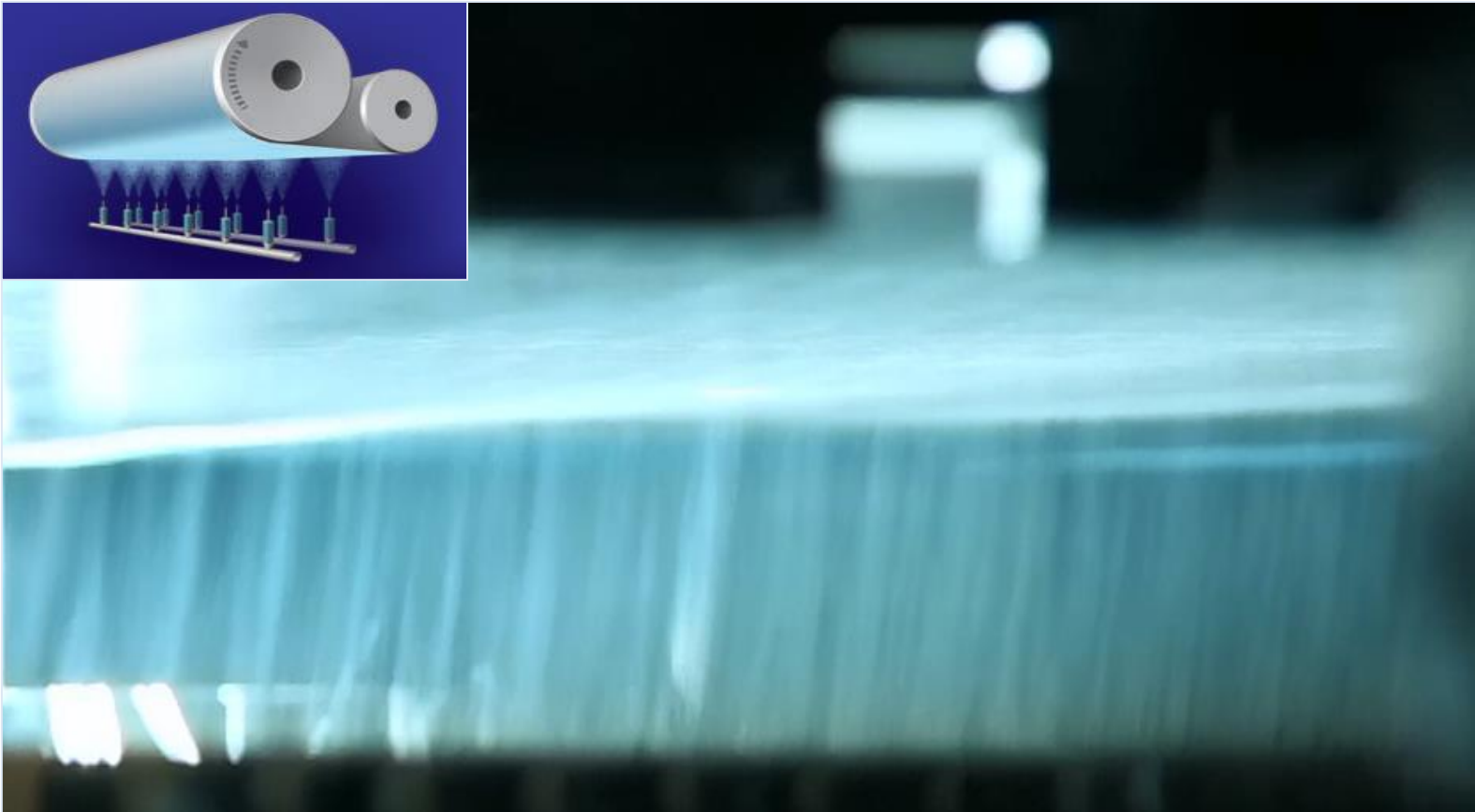
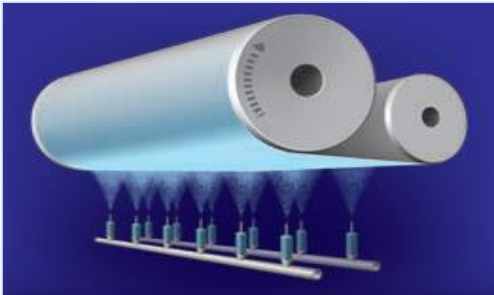
MELE BLOWN TYPE MASK



NANO QUEEN MASK

Remove harmful substances by joining static electricity on the fiber  
 It can be seen that dust is attached to the fiber by electrostatic force  
 Superior filtration performance by joining structural properties (extremely non-surface) of nanofiber  
 Fine dust is efficiently filtered by a dense network of structures.

# NANOFIBER FILTER Electrosinning



Electrospinning PVDF Membrane