

SHANGHAI NANOFILTECH NEW MATERIAL TECHNOLOGY

F I L T E R F O R F U T U R E

2023



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CONCENTRATION TO INNOVATION FOR REVOLUTION



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01

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PART ONE

ABOUT US



ABOUT US

Founded in 2018, as a national high-tech enterprise, NanoFiltech focus on the R&D, production and sales of high-class nanofiber filtration media, flexible ceramic nanofiber membrane and Ultra light thermal wadding which can be applied to semiconductor, battery, pharmacy, automotive, aviation, military, HVAC, livestock, clean rooms, industrial dust&pollutants treatment, clothing industries, etc.



DATA

125 staffs, two running factories, two R&D centers, totally 20,000+m² production area; new factory is in the process; 50,000,000 m² annual capacity;



PART OF HONORS

- ❑ First Prize of Science and Technology Progress presented by China National Textile Industry Council;
- ❑ First Prize of Science and Technology Progress presented by Shanghai government;
- ❑ First Prize of Science and Technology Progress presented by All-China Environment Federation;



FINANCING

- Angel round investment in 2019;
- A round investment in 2021;
- Gross domestic sales \$21,500,000 in 2022;
- B round investment in 2023;



R&D

- ❑ Zhejiang Province Nanofiber R&D Center;
- ❑ Zhejiang Province Postdoctoral Workstation and Overseas Academician Workstation;
- ❑ 31 core authorized patents for invention, 10 pending patents;





ABOUT US

PART OF PRODUCTION FACILITIES

CORE TECHNOLOGIES OF THE EQUIPMENTS ARE ALL
INDEPENDENTLY R&D





ABOUT US

Manufacturing Strength

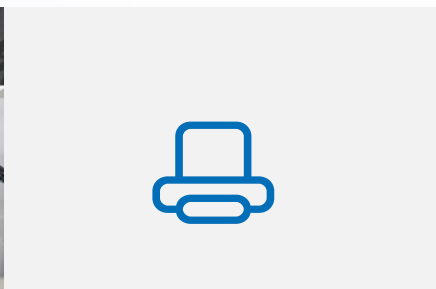


QUALITY CONTROL

- Imported high-class testing instruments to ensure the quality of the products;
- Full process, full index test to ensure the products fully in line with the standard;
- Advanced R&D platform, to control the performance of the products;



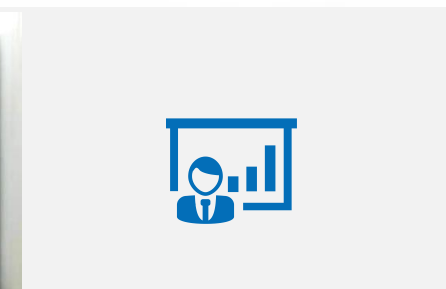
TSI material tester



CADR 30m³ chamber



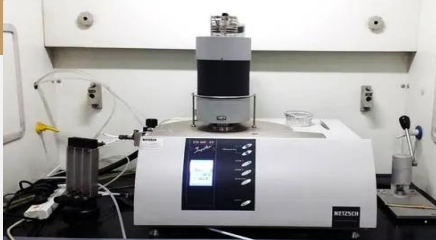
CCM 3m³ chamber



Hydrolytic resistance tester



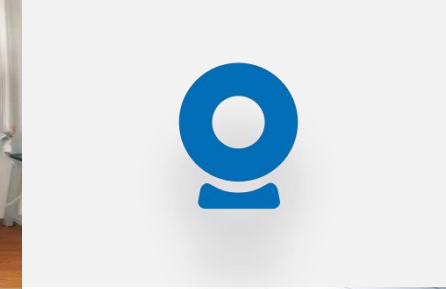
Imported E-microscope tester



Aperture tester



DHC tester



Lifespan evaluation chamber

02

PART

PART TWO

OUR PRODUCTS



OUR PRODUCTS

FILTRATION MEDIA

- **Nanofiber air filtration media**
- Industrial nanofiber filtration paper
- PTFE nanofiber membrane
- Melt-blown material
- Chemical filtration media
- (Anti bacteria/ virus technology)
- Nanofiber liquid separation media

- ◆ Commercial: Personal protection, Air purifying, HVAC systems, etc.
- ◆ Industrial: Clean rooms/workshops air filtration, Industrial AMC filtration, Engine, Air compressor, livestock industry, etc.

FLEXIBLE CERAMIC INSULATION MEMBRANE

Flexible ceramic insulation membrane

- Used in insulation in high-temp condition: Insulation components of missile battery, Aviation, Fire prevention parts, Septum for new energy battery, etc.

ULTRA-LIGHT THERMAL WADDING

■ Silver nap

- Used in thermal sectors: Civil, Military, Sport cold-proof clothing and shoes/boots, etc.



ABOUT OUR COMPETITIVE PRODUCTS-FIBERGLASS& MELT-BLOWN



MELT-BLOWN MATERIAL

ADVANTAGE: Low air resistance, low energy cost;

DISADVANTAGE: The filtration performance shrinks a lot when the static run out;



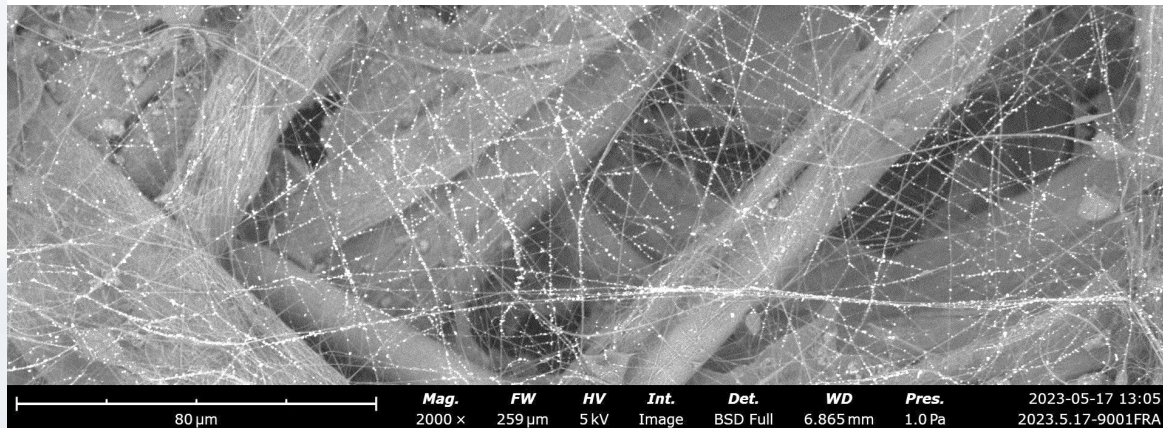
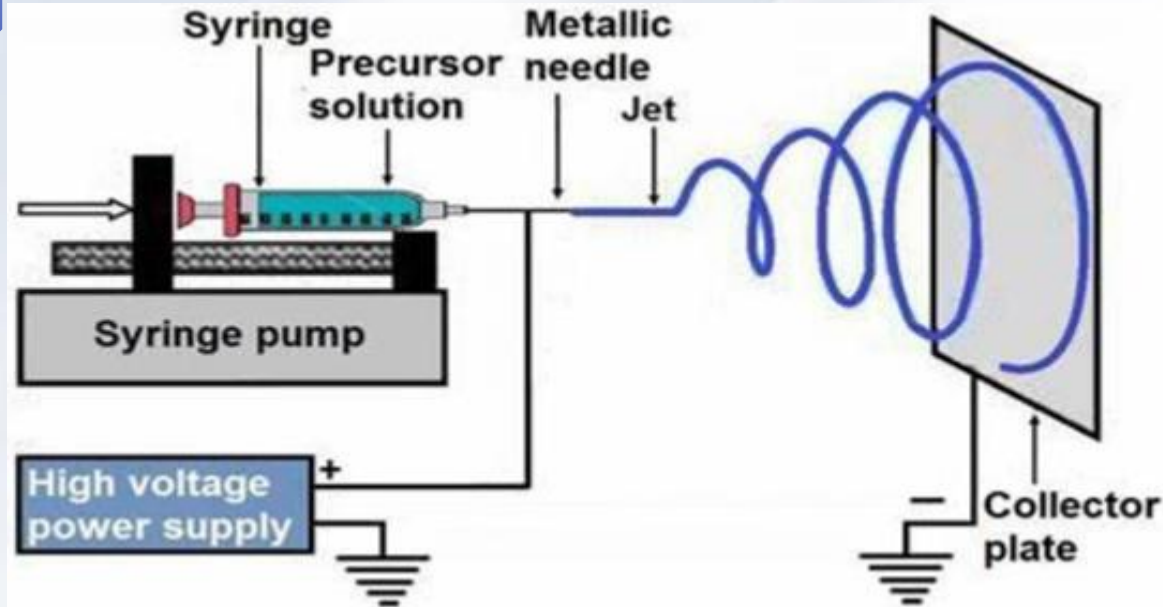
FIBERGLASS MATERIAL

ADVANTAGE: Purely physical interception, filtration performance would not shrink;

DISADVANTAGE: Too much high air resistance; high energy cost; It will cause the cancer;



Nanofiber air filtration media



It bypass the disadvantages of the performance of fiberglass and melt-blown materials

Pure physical filtration

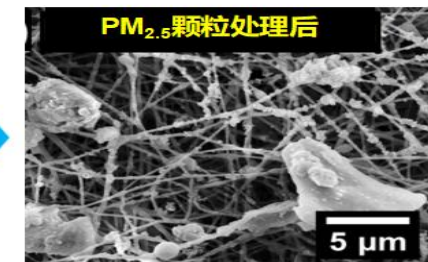
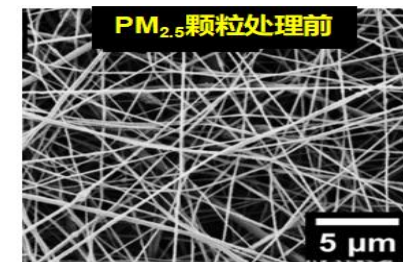


It solves the problem of the performance reduction after destaticization of the melt-blown material.

80% porosity



Fiber diameter 100-300nm, it solves the problem of the high air resistance using fiberglass material.



This shows the performance of the nanofiber filtration material before and after it meet PM_{2.5} particals.



NANOFIBER AIR FILTRATION MEDIA

Formula for
energy cost
calculation

$$E = \frac{Q * \Delta P * T * C}{1000\varphi}$$

Q means
air quantity
(m3/s)

ΔP means air
resistance of the filter
(Pa)

T means system
running hours
(hour)

C means electricity
cost per KWH

φ means the fan
efficiency
(%)

For example with the regular Fan Filtration Unit in clean room system:

$\Delta P=1\text{Pa}$

$\varphi=50\%$

Wind speed=0.45 m/s

$Q=0.65\text{ m3/s}$

$T= 7200$ (running 300 days per year)

$C=0.11\text{ USD/KWh}$

Then $E= \text{USD } 1.04$

| ITEM | FIBERGLASS MEDIA | NANOFIBER COMPOSITE MEDIA |
|----------------------------------|------------------|---------------------------|
| FIBER DIAMETER | 400-700nm | 100-200nm |
| PHYSICAL INTERCEPTION EFFICIENCY | > 85% | > 85% |
| AIR RESISTANCE | 83Pa | 36Pa |
| AIR PERMEABILITY | 112.5L/ m2•s | 180L/m2•s |
| LIFESPAN | 1 YEAR | 1 YEAR AND 4 MONTHS |

The testing result means, the annual energy cost can reduce USD 1.04/year/filter/Pa. If we can reduce 30Pa per filter, If we have 10000 filters in use..... Please think about how much money can be saved for you or your customer?



TDS FOR NANOFIBER AIR FILTRATION MEDIA

| No. | Filtration efficiency level | Product name | Weight (g/m ²) | Thickness (mm) | Air permeability (L/m ² .s) @200Pa | Vertical Stiffness factor (mg) | Horizontal Stiffness factor (mg) | Initial filtration efficiency (%) | Final filtration efficiency (%) | Resistance (Pa) | Tensile strength (N/5cm) | | | | Heat resistance (°C) | Dust holding Capacity (mg/m ²) @32L/min 0.3µm NaCl | Hydrophobicity | | | | Width range (mm) | Length range (m) |
|-----|-----------------------------|--------------|----------------------------|----------------|---|--------------------------------|----------------------------------|-----------------------------------|---------------------------------|-----------------|--------------------------|--------------------------------|------------|-----------------------------|----------------------|--|---------------------------------|--------------------------------|---|--|------------------|------------------|
| | | | | | | | | | | | Before stretch | After freeze 24 hours in -20°C | After thaw | After 1 hour baking in 80°C | | | resistance before moisture (Pa) | resistance after moisture (Pa) | filtration efficiency before moisture (%) | filtration efficiency after moisture (%) | | |
| 1 | F9 | NFTF9N | 85±5 | 0.6±0.05 | 350±20 | ≥400 | ≥200 | ≥90 | ≥80 | <38 | 184.5 | 188.8 | 186.7 | 191.2 | 130 | >950@120Pa | 35.1 | 35.4 | 97.60% | 97.40% | ≤1600 | ≤500 |
| 2 | F9 | NFTF9HC | 102±5 | 0.65±0.05 | 350±20 | ≥450 | ≥200 | ≥90 | ≥85 | <38 | 196.5 | 201.4 | 197.7 | 206 | 130 | >1160@120Pa | 35.5 | 35.8 | 97.60% | 97.40% | ≤1600 | ≤500 |
| 3 | H10 | NFTH10N | 85±5 | 0.6±0.05 | 300±20 | ≥400 | ≥200 | ≥95 | ≥90 | <45 | 184.5 | 188.8 | 186.7 | 191.2 | 130 | >800@120Pa | 41.1 | 41.4 | 98.40% | 98% | ≤1600 | ≤500 |
| 4 | H10 | NFTH10HC | 102±5 | 0.65±0.05 | 300±20 | ≥450 | ≥200 | ≥95 | ≥90 | <45 | 196.5 | 201.4 | 197.7 | 206 | 130 | >960@120Pa | 42 | 42.4 | 98.40% | 98% | ≤1600 | ≤500 |
| 5 | H11 | NFTH11N | 85±5 | 0.6±0.05 | 260±20 | ≥400 | ≥200 | ≥99 | ≥95 | <52 | 184.5 | 188.8 | 186.7 | 191.2 | 130 | >600@120Pa | 49.7 | 50.2 | 99.20% | 98.80% | ≤1600 | ≤500 |
| 6 | H11 | NFTH11HC | 102±5 | 0.65±0.05 | 260±20 | ≥450 | ≥200 | ≥99 | ≥95 | <52 | 196.5 | 201.4 | 197.7 | 206 | 130 | >720@120Pa | 50.1 | 50.5 | 99.20% | 98.80% | ≤1600 | ≤500 |
| 7 | H12 | NFTH12 | 110±5 | 0.65±0.05 | 100±10 | ≥500 | ≥300 | ≥99.9 | ≥99.5 | <155 | 127.4 | 130 | 128.6 | 133.1 | 130 | >2150@320Pa | 152 | 152.8 | 99.90% | 99.74% | ≤1600 | ≤500 |
| 8 | H13 | NFTH13 | 115±5 | 0.65±0.05 | 55±10 | ≥500 | ≥300 | ≥99.99 | ≥99.97 | <180 | 111.5 | 113.5 | 113 | 115.8 | 130 | >2800@320Pa | 180 | 181 | 99.99% | 99.98% | ≤1600 | ≤500 |
| 9 | H14 | NFTH14 | 115±5 | 0.65±0.05 | 45±10 | ≥500 | ≥300 | ≥99.999 | ≥99.995 | <230 | 106 | 108.3 | 107.7 | 109 | 130 | >4050@460Pa | 230 | 232 | 99.999% | 99.996% | ≤1600 | ≤500 |

REMARK:

** It is with the structure of **SUPPORT LAYER+MELT-BLOWN LAYER+NANOFIBER LAYER+SPUNBOND LAYER**;

**All the data above are from the test using 0.3µm NaCl particle, testing air capacity is 32L/min; Testing initial resistance is 120 Pa (for H12 & H13 are @320Pa; for H14 is @460Pa), testing equipment TSI3160. Given that the test condition will be different, so if you want to test our product, this remark will be helpful and referable.

**Final filtration efficiency means the filtration efficiency under the double initial air resistance which test initial filtration efficiency.



ADVANTAGES OF NANOFIBER AIR FILTRATION MEDIA

01

Pure physical interception make it keeping high filtration efficiency without statics electricity

02

Large specific surface area make it keeping high dust holding capacity

03

Thin fiber diameter make it keeping very low resistance during operation

04

Strong structure make it keeping high filtration efficiency from beginning to the end, 99.997% at most

05

High dust holding capacity and high tensile strength make it longer service life

06

Small aperture and thin fiber make it keeping high hydrophobicity.

AND

Easy to clean,
and burnable



Application for nanofiber composite media



Semiconductor



Hospital



Bio/Pharmacy



Food& Beverage



Commercial Buildings



Livestock



Chemical/Paper
pulp



Air conditioning



Automotive
coating



Machining



Food
services



Railway
transportation



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■ Silver nap

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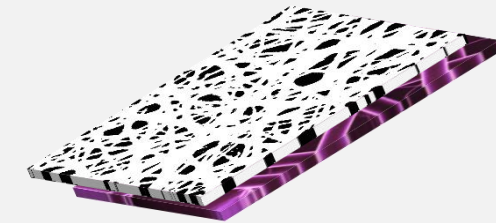
WHAT IS IT?

NANOFIBER
LAYER

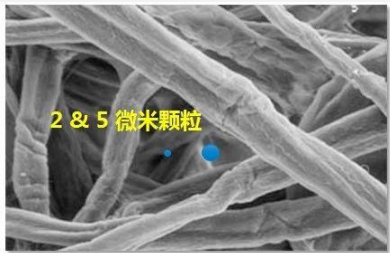
WOOD PULP
PAPER



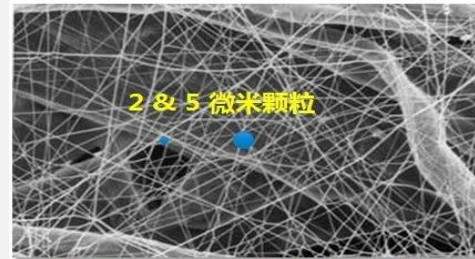
INDUSTRIAL NANOFIBER
FILTRATION PAPER



EMD of wood pulp paper

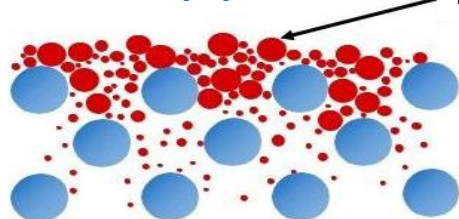


EMD of nanofiber filtration paper

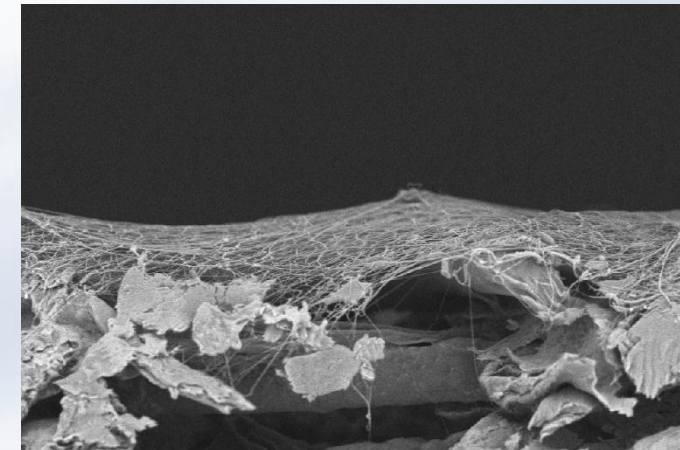
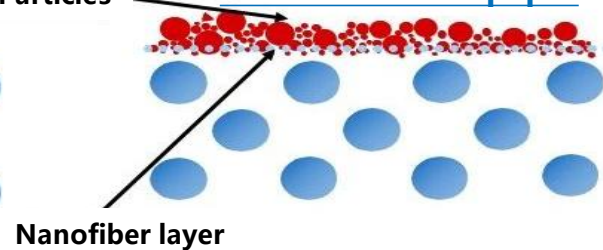


VS

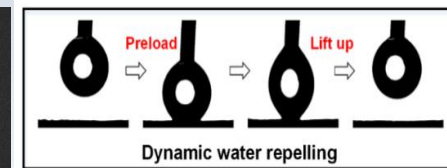
Osmosis filtration of
wood paper



Surface filtration of
nanofiber wood paper



Average diameter: 100nm



Good hydrophobicity

TDS OF INDUSTRIAL NANOFIBER FILTRATION PAPER(for engine/turbine engine)

| Product name | Weight (g/m ²) | Total Thickness (mm) | Corrugation Depth (mm) | Max aperture size (μm) | Stiffness (mN•m) | Burst Strength (kPa) | Dry MD Tensile Strength (N/15mm) | Dry CD Tensile Strength (N/15mm) | Air permeability@ ΔP=200Pa (L/ m ² •s) | Filtration Efficiency (%) | Resistance (Pa) |
|--------------|----------------------------|----------------------|------------------------|------------------------|------------------|----------------------|----------------------------------|----------------------------------|---|---------------------------|-----------------|
| NFP70 | 120 ± 6 | 0.5±0.1 | 0.2±0.1 | ≤60 | ≥2.5 | ≥250 | 3.3 | 1.4 | 210±30 | > 70 | <50 |
| NFP9570 | 125 ± 6 | 0.6±0.1 | 0.4±0.1 | ≤60 | ≥4.0 | ≥200 | 4.5 | 1.7 | 300±30 | > 70 | <50 |
| NFP9570FR | 135 ± 6 | 0.45±0.05 | 0.2±0.1 | ≤60 | ≥4.0 | ≥200 | 3 | 1.7 | 310±30 | > 70 | <50 |
| NFP9001FRA | 150 ± 7 | 0.6±0.1 | 0.35±0.1 | ≤70 | ≥3.0 | ≥200 | 3.5 | 1.7 | 250±30 | > 70 | <50 |
| NFP90F9 | 95 ± 6 | 0.25±0.1 | | ≤70 | ≥1.2 | ≥200 | 4.3 | 2.7 | 260±30 | > 50 | <65 |
| NFP5045 | 120 ± 5 | 0.65±0.1 | 0.4±0.1 | ≤60 | ≥4.5 | ≥200 | 3.5 | 1.7 | 280±30 | > 55 | <50 |

**Testing condition: Tested by Longman filtration inspection equipment; @wind 5.3cm/s, 0.3 micron Nacl particles;

**Support layer can be customized by the customer. The test data will vary depending on the different support layer material;

Compared to the traditional cellulose filter media, industrial nanofiber filtration paper can provide higher filtration efficiency, higher air permeability, higher efficiency stability, higher lifespan, easier blowback, and energy cost saving.

TDS OF INDUSTRIAL NANOFIBER FILTRATION PAPER(for industrial dust filtration)

| Product name | Weight (g/m ²) | Total Thickness (mm) | Corrugation Depth (mm) | Max aperture size (μm) | Stiffness (mN·m) | Burst Strength (kPa) | Dry MD Tensile Strength (N/15mm) | Dry CD Tensile Strength (N/15mm) | Air permeability @ ΔP=200Pa (L/ m ² ·s) | Filtration Efficiency (%) | Resistance (Pa) | Surface electrical resistivity (Ω) | Flame retardant level |
|--------------|----------------------------|----------------------|------------------------|------------------------|------------------|----------------------|----------------------------------|----------------------------------|--|---------------------------|-----------------|------------------------------------|-----------------------|
| NFP7020 | 120 ± 6 | 0.6±0.1 | 0.3±0.1 | ≤60 | ≥3.0 | ≥350 | 3.3 | 1.4 | 210±30 | > 70 | <50 | | |
| NFP900120FRA | 150 ± 7 | 0.65±0.1 | 0.35±0.1 | ≤70 | ≥3.5 | ≥300 | 3.5 | 1.7 | 180±30 | > 70 | <55 | ≤10 ⁵ | F1 |
| NFP957020 | 120 ± 6 | 0.7±0.1 | 0.4±0.1 | ≤60 | ≥4.5 | ≥300 | 4.5 | 1.7 | 300±30 | > 70 | <50 | | |
| NFP957020FRA | 135 ± 6 | 0.7±0.1 | 0.4±0.1 | ≤60 | ≥4.5 | ≥300 | 3 | 1.7 | 300±30 | > 70 | <50 | | F1 |

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APPLICATION



- 1, Woodworking: dust from grinding, polishing, sawing, milling, planing process;
- 2, Manufacturing: dust from crushing, mixing, feeding, bagging process;
- 3, Hardware: grinding, polishing, sawing, milling, planing process;
- 4, Food: dust generated during processing to the flour, rice, milk powder, grain and oil, etc.;
- 5, Chemical: fertilizer, paint, washing powder, dust generated by the production process;
- 6, Construction industry: dust from cement, ceramics, glass, fiber, steel, stone production process.



▲ **Woodwork**



▲ **Machining**



▲ **Coating**



▲ **Metallurgy**



▲ **Foundry**



▲ **Chemical**



▲ **Food**



▲ **Paper making**





OUR PRODUCTS

FILTRATION MEDIA

- Nanofiber air filtration media
- Industrial nanofiber filtration paper
- **PTFE nanofiber membrane**
- Melt-blown material
- Chemical filtration media
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■ Silver nap

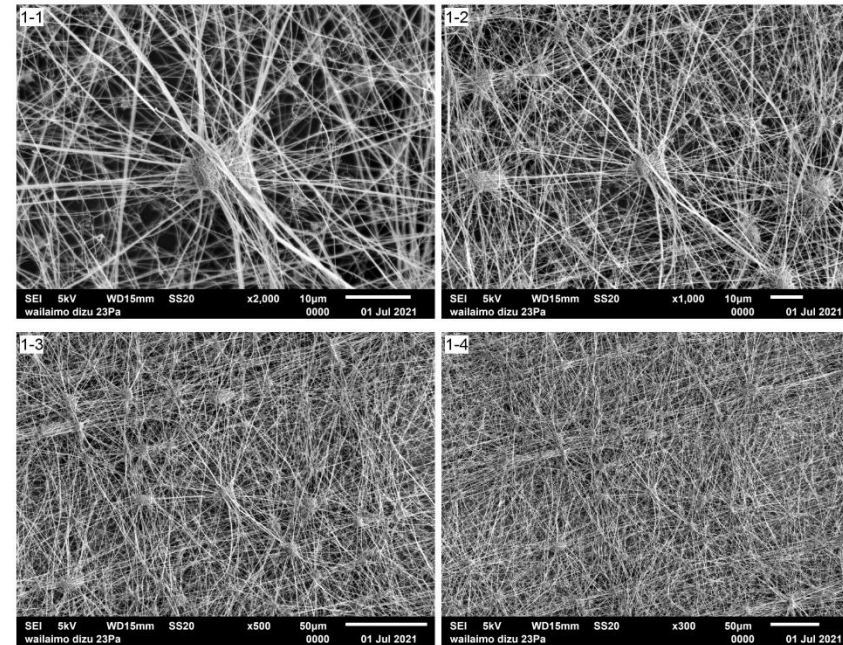
- Used in thermal sectors: Civil, Military, Sport cold-proof clothing and shoes/boots, etc.



BRIEF INTRODUCTION

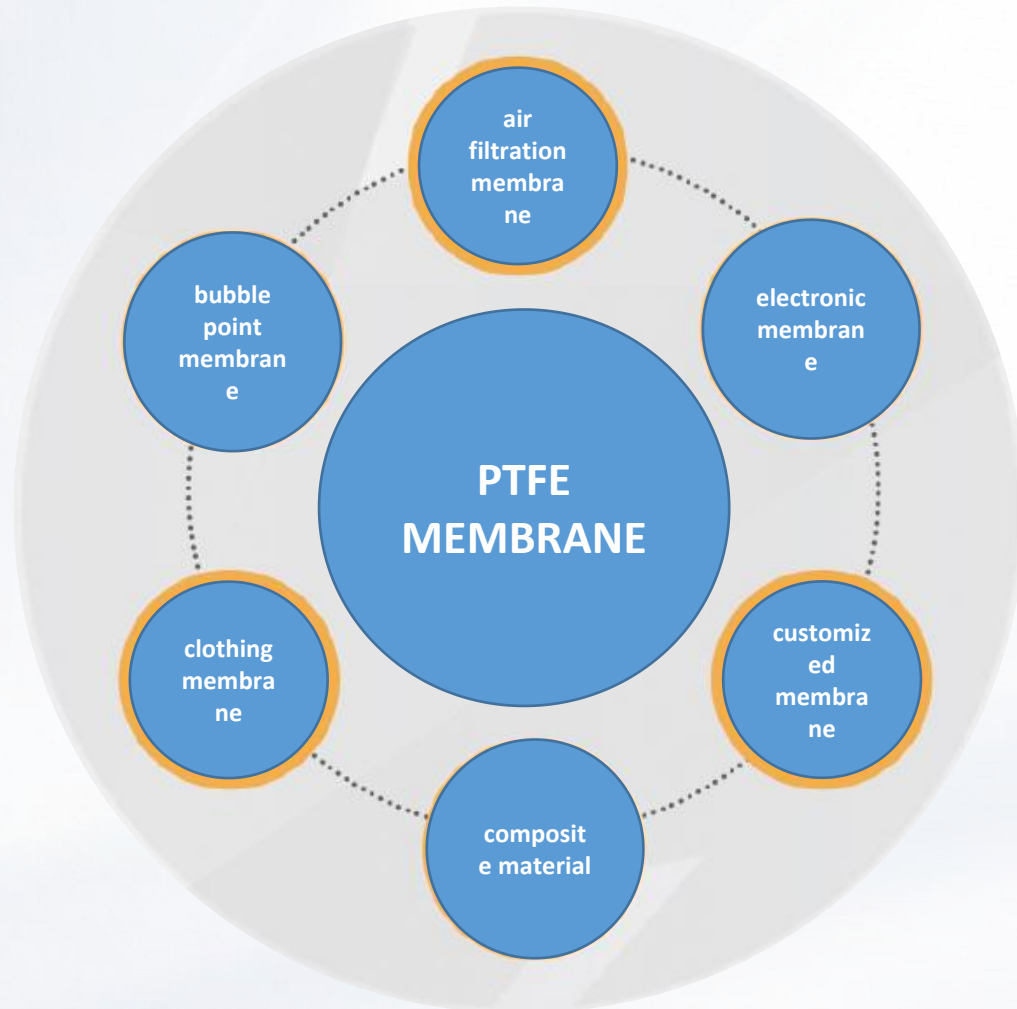
Our PTFE nanofiber membrane is a kind of high-end multifunctional material with the knot+aperture structure(fiber diameter is 100-200nm). The aperture is tiny, average and stable, and the porosity is > 80% .

The QF(quality factor) of our PTFE membrane is 29, double as fiberglass material.





BRIEF INTRODUCTION



- Super high filtration efficiency, our products covers H10-U16 level;
- Its air resistance is only 1/2-1/3 of fiberglass material;
- High chemical stability, high resistance to high temperature, corrosion and aging;
- Low surface filtration performance, easy for blowback;
- High acoustical and air permeability, and hydrophobicity;
- Long lifespan with high tensile strength;



TDS FOR PTFE NANOFIBER COMPOSITE MEMBRANE

PTFE nanofiber composite membrane structure is SUPPORT LAYER+PTFE NANOFIBER MEMBRANE+SUPPORT LAYER. **It can be applied to HEPA filter.**

| No. | Filtration efficiency level | Product name | Weight (g/m ²) | Thickness (mm) | Filtration efficiency@TSI8130 32L/min NaCl (0.3μm) (%) | Filtration efficiency@TSI8130 32L/min NaCl (0.1-0.2μm) (%) | Resistance@TSI8130 32L/min NaCl (Pa) |
|-----|-----------------------------|--------------|----------------------------|----------------|--|--|--------------------------------------|
| 1 | ISO15E | 01690P230G80 | 80±5 | 0.3±0.05 | ≥99 | ≥95 | 60±20 |
| 2 | ISO20E | 01290P80G80 | 80±5 | 0.3±0.05 | ≥99.5 | ≥99 | 80±20 |
| 3 | ISO25E | 01295P95G80 | 80±5 | 0.3±0.05 | ≥99.9 | ≥99.5 | 95±20 |
| 4 | ISO30E | 01390P105G80 | 80±5 | 0.3±0.05 | ≥99.95 | ≥99.9 | 105±30 |
| 5 | ISO35H | 01395P120G80 | 80±5 | 0.3±0.05 | ≥99.995 | ≥99.95 | 120±30 |
| 6 | ISO40H | 01490P135G80 | 80±5 | 0.3±0.05 | ≥99.995 | ≥99.99 | 135±30 |
| 7 | ISO45H | 01495P150G80 | 80±5 | 0.3±0.05 | ≥99.999 | ≥99.995 | 150±30 |
| 8 | ISO50U | 01590P165G80 | 80±5 | 0.3±0.05 | / | ≥99.999 | 165±30 |
| 9 | ISO55U | 01595P220G80 | 80±5 | 0.3±0.05 | / | ≥99.9995 | 220±30 |
| 10 | ISO60U | 01690P230G80 | 80±5 | 0.3±0.05 | / | ≥99.9999 | 230±30 |
| 11 | ISO65U | 01695P250G80 | 80±5 | 0.3±0.05 | / | ≥99.99995 | 250±30 |



TDS FOR NONWOVEN FABRIC TECTORIAL PTFE MEMBRANE

PTFE nanofiber composite membrane structure is NONWOVEN FABRIC+PTFE NANOFIBER MEMBRANE. It can be applied to industrial dust collection sectors, etc.

| No. | Product name | Thickness (mm) | Weight (g/m ²) | Thickness (mm) | Resistance@TSI8130 32L/min NaCl (Pa) | Filtration efficiency@TSI8130 32L/min NaCl (0.3μm) (%) | Verticle tensile strength (N/5cm) | Horizontal tensile strength (N/5cm) |
|-----|--------------|----------------|----------------------------|----------------|---|---|-----------------------------------|-------------------------------------|
| 1 | JZ100H11 | 0.4±0.05 | 100±5 | 0.3±0.05 | 45±10 | ≥95 | 220 | 80 |
| 2 | JZ100H12 | 0.45±0.05 | 100±5 | 0.3±0.05 | 120±20 | ≥99.5 | 300 | 80 |
| 3 | JZ120H11 | 0.5±0.05 | 120±6 | 0.3±0.05 | 50±20 | ≥95 | 320 | 90 |
| 4 | JZ120H12 | 0.5±0.05 | 120±6 | 0.3±0.05 | 120±20 | ≥99.5 | 320 | 90 |
| 5 | JZ120H13 | 0.5±0.05 | 120±6 | 0.3±0.05 | 250±25 | ≥99.97 | 320 | 90 |



TDS FOR PET TECTORIAL PTFE MEMBRANE

PTFE nanofiber composite membrane structure is PET LAYER+PTFE NANOFIBER MEMBRANE. It can be applied to commercial& industrial dust collection sectors, etc.

| No. | Product name | Filtration level | Thickness (mm) | Weight (g/m ²) | Filtration efficiency@TSI8130 32L/min NaCl (0.3μm) (%) | Verticle tensile strength (N/5cm) | Horizontal tensile strength (N/5cm) |
|-----|--------------|------------------|----------------|----------------------------|--|-----------------------------------|-------------------------------------|
| 1 | DP100H13 | H13 | 0.38±0.05 | 100±5 | ≥99.97 | 300 | 260 |
| 2 | DP100H14 | H14 | 0.38±0.05 | 100±5 | ≥99.995 | 300 | 260 |
| 3 | DP120H12 | H12 | 0.4±0.05 | 120±6 | ≥99.5 | 350 | 280 |
| 4 | DP150H11 | H11 | 0.45±0.05 | 150±8 | ≥95 | 380 | 330 |
| 5 | DP150H12 | H12 | 0.45±0.05 | 150±8 | ≥99.5 | 380 | 330 |
| 6 | DP150H13 | H13 | 0.45±0.05 | 150±8 | ≥99.97 | 380 | 330 |
| 7 | DP200H14 | H14 | 0.48±0.05 | 200±10 | ≥99.995 | 700 | 600 |
| 8 | DP130H14 | H14 | 0.45±0.03 | 130±10 | ≥99.995 | 330 | 290 |



TDS FOR TWO-COMPONENT NONWOVEN FABRIC TECTORIAL PTFE MEMBRANE

PTFE nanofiber composite membrane structure is TWO-COMPONENT NONWOVEN FABRIC+PTFE NANOFIBER MEMBRANE. **It can be applied to commercial& industrial dust collection sectors, etc.**

| No. | Filtration efficiency level | Thickness (mm) | Weight (g/m ²) | Resistance@ TSI8130 32L/min NaCl (Pa) | Air permeability @ $\Delta P=200Pa$ (L/ m ² ·s) | Filtration efficiency@TSI8130 32L/min NaCl (0.3 μ m) (%) | Verticle tensile strength (N/5cm) | Horizontal tensile strength (N/5cm) |
|-----|-----------------------------|-----------------|----------------------------|---------------------------------------|--|--|-----------------------------------|-------------------------------------|
| 1 | DP130H13S | 0.38 \pm 0.05 | 130 \pm 7 | 350 \pm 35 | | ≥ 99.95 | 450 | 270 |
| 2 | DP240H11S | 0.6 \pm 0.05 | 240 \pm 12 | 150 \pm 15 | | ≥ 95 | 720 | 600 |
| 3 | DP240H12S | 0.6 \pm 0.05 | 240 \pm 12 | 200 \pm 20 | | ≥ 99.5 | 720 | 600 |
| 4 | DP240H13S | 0.6 \pm 0.05 | 240 \pm 12 | 350 \pm 35 | > 70 | ≥ 99.95 | 720 | 600 |
| 5 | DP260H11S | 0.6 \pm 0.05 | 260 \pm 13 | 150 \pm 15 | > 70 | ≥ 95 | 930 | 800 |
| 6 | DP260H13S | 0.6 \pm 0.05 | 260 \pm 13 | 350 \pm 35 | | ≥ 99.95 | 930 | 800 |
| 7 | DP170H11S | 0.5 \pm 0.05 | 170 \pm 10 | 80 \pm 16 | | ≥ 95 | 580 | 430 |



PTFE NANOFIBER MEMBRANE

Nanofiltech

APPLICATION



BIO&PHARMACY



HOSPITAL CLEAN ROOM



DUST COLLECTOR FILTER



INDUSTIAL DUST COLLECTION FILTER



CLEAN ROOMS OF ELECTRONIC INDUSTRY



FOOD& BEVERAGE



WATER PROOF&BREATHABLE CLOTH



INDUSTIAL WATER
PROOF%BREATHABLE SECTOR



OUR PRODUCTS

FILTRATION MEDIA

- Nanofiber air filtration media
- Industrial nanofiber filtration paper
- PTFE nanofiber membrane
- **Melt-blown material**
- Chemical filtration media
- (Anti bacteria/ virus technology)
- Nanofiber liquid separation media

- ◆ Commercial: Personal protection, Air purifying, HVAC systems, etc.
- ◆ Industrial: Clean rooms/workshops air filtration, Industrial AMC filtration, Engine, Air compressor, livestock industry, etc.

FLEXIBLE CERAMIC INSULATION MEMBRANE

Flexible ceramic insulation membrane

- Used in insulation in high-temp condition: Insulation components of missile battery, Aviation, Fire prevention parts, Septum for new energy battery, etc.

ULTRA-LIGHT THERMAL WADDING

■ Silver nap

- Used in thermal sectors: Civil, Military, Sport cold-proof clothing and shoes/boots, etc.



TDS FOR MELT-BLOWN MATERIAL

The high efficiency and low resistance melt-blown material is produced with our independently R&D electrostatic electret technology. It has the features of high charge stability, long charge storage duration, low resistance, high dust holding capacity and high filtration efficiency. It can be widely applied to the personal protection, air purifiers, HVAC systems, etc..

| Product name | Filtration level | Weight (g/m ²) | Thickness (mm) | Efficiency (%) | Resistance (Pa) | Width range (mm) | Remark |
|--------------|------------------|----------------------------|----------------|----------------|-----------------|------------------|---|
| FRP-P85% | H10 | 15±4 | 0.55±0.05 | ≥85 | ≤8 | 1600 | Melt-blown material tested @32L/min.dm ² by 0.3um NaCl particles. |
| FRP-P90% | H10 | 15±4 | 0.55±0.05 | ≥90 | ≤9 | 1600 | |
| FRP-P95% | H11 | 20±4 | 0.55±0.05 | ≥95 | ≤10 | 1600 | |
| FRP-P98% | H11 | 20±4 | 0.55±0.05 | ≥98 | ≤12 | 1600 | |
| FRP-P99.5% | H12 | 25±4 | 0.60±0.05 | ≥99.5 | ≤16 | 1600 | |
| FRP-P99.97% | H13 | 30±2 | 0.65±0.05 | ≥99.97 | ≤25 | 1600 | |
| FRP-FP90% | H10 | 75±4 | 0.55±0.05 | ≥90 | ≤11 | 1600 | Melt-blown material+60g support layer, tested @32L/min.dm ² by 0.3um NaCl particles. |
| FRP-FP95% | H11 | 80±4 | 0.55±0.05 | ≥95 | ≤12 | 1600 | |
| FRP-FP98% | H11 | 80±4 | 0.55±0.05 | ≥98 | ≤14 | 1600 | |
| FRP-FP99.5% | H12 | 85±4 | 0.60±0.05 | ≥99.5 | ≤16 | 1600 | |
| FRP-FP99.97% | H13 | 110±2 | 0.65±0.05 | ≥99.97 | ≤27 | 1600 | |



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CHEMICAL FILTRATION MEDIA

MODIFIED CARBON FILTER CLOTH

Modified carbon filter cloth is composited by multi-layer nonwoven fabrics with different filtering performance and carbon interlayered(PET+modified carbon+PET). It has good tensile strength, as well as adsorption and decomposition of activated carbon and microporous filtration performance.



HIGH FILTRATION EFFICIENCY ON DUST AND GASEOUS POLLUTANT BOTH.

HIGH GASEOUS POLLUTANT HOLDING CAPACITY, LONG LIFESPAN.



ACCURATELY REMOVE GASEOUS POLLUTANTS IN VARIOUS APPLICATION ENVIRONMENT.

LOW RESISTANCE, NO INCREMENTAL PRESSURE LOSS, ENVIRONMENT-FRIENDLY;





TDS OF MODIFIED CARBON FILTER CLOTH

| Function | Product name | Carbon content (g/m ²) | Weight (g/m ²) | Thickness (mm) | Air permeability @200Pa (L/m ² S) | Performance to gaseous pollutants | | |
|-----------------|--------------|------------------------------------|----------------------------|----------------|--|-----------------------------------|------------------------|----------------------------------|
| | | | | | | Kind | Initial efficiency (%) | Pollutants holding capacity (mg) |
| Acid removing | MA480 | 480 | 630±20 | 1.92 | 824 | Sulfur dioxide | 97.14 | 289.8 |
| Acid removing | MA600 | 600 | 750±20 | 2.04 | 797 | Sulfur dioxide | 98.77 | 332.3 |
| Acid removing | MA800 | 800 | 950±20 | 2.35 | 729 | Sulfur dioxide | 99.09 | 610.3 |
| Alkali removing | MB480 | 480 | 630±20 | 2.02 | 876 | Ammonia gas | 91.79 | 107.1 |
| Alkali removing | MB600 | 600 | 750±20 | 2.32 | 826 | Ammonia gas | 93.93 | 123.8 |
| Alkali removing | MB800 | 800 | 950±20 | 2.62 | 795 | Ammonia gas | 96.38 | 227.2 |
| VOCs removing | MC300 | 300 | 410±20 | 1.32 | 844 | n-butane | 91.31 | 71 |
| | | | | | | Toluene | 90.79 | 331.7 |
| VOCs removing | MC480 | 480 | 610±20 | 1.96 | 811 | n-butane | 91.33 | 87.6 |
| | | | | | | Toluene | 90.81 | 531.2 |
| VOCs removing | MC600 | 600 | 730±20 | 2.01 | 779 | n-butane | 92.57 | 195 |
| | | | | | | Toluene | 91.03 | 662 |
| VOCs removing | MC800 | 800 | 930±20 | 2.28 | 745 | n-butane | 95.85 | 232.8 |
| | | | | | | Toluene | 91.59 | 873 |



TDS OF MODIFIED CARBON FILTER CLOTH

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|-------------------|--------------|------------------------------------|----------------------------|----------------|--|-----------------------------------|--------------------------|----------------------------------|
| | | | | | | Kind | Initial efficiency (%) | Pollutants holding capacity (mg) |
| Multi-functional | MACNT2550 | 300 | 430±20 | 1.81 | 892 | N-butane | 93.31 | 174 |
| | | | | | | Toluene | 90.79 | 187 |
| | | | | | | Sulfur dioxide | 98.56 | 131 |
| Methanal removing | CQ230 | 230 | 320±10 | 1.15 | 748 | Methanal | CADR (m ³ /h) | 121 |
| Regular H10 | GM150 | 150 | 250±20 | 0.95 | 755 | | | |

****Many colors for customization. Width of the roll is up to 1500mm;**

Test condition:

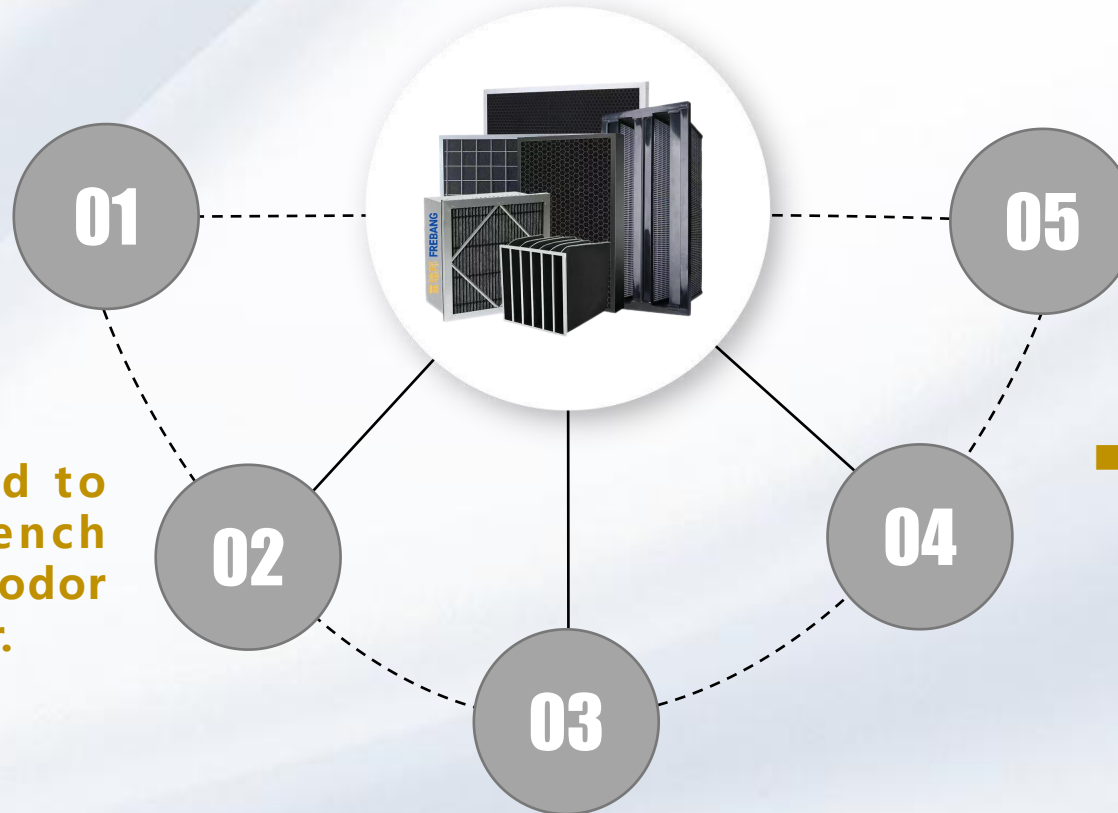
| Function | Test area(cm ²) | Pollutants density(ppm) | | | | | Air volume(L/min) | Power(W) |
|-------------------|-----------------------------|-------------------------|-------------|----------|---------|----------|-------------------|----------|
| | | Sulfur dioxide | Ammonia gas | N-butane | Toluene | Methanal | | |
| Acid removing | 100 | 30 | | | | | 73.9 | |
| Alkali removing | 100 | | 30 | | | | 74.2 | |
| VOCs removing | 100 | | | 80 | 80 | | 79.7 | |
| Multi-functional | 100 | 30 | | 80 | 80 | | 75.5 | |
| Methanal removing | 6380 | | | | | * | 3500 | 37.7 |



MODIFIED CARBON FILTER CLOTH CAN BE APPLIED TO:

- Anywhere need to block the corrosive gas to protect the key equipments from erosion.

- Anywhere need to remove the stench and unpleasant odor from the fresh air.



- Anywhere need to store/ demonstrate/ protect the precious cultural relics, works of art and archival documents.

- Anywhere need to enlong the quality gaurantee period of fresh flowers, vegetables, meat, seafood, etc. .

- Anywhere need to purify the indoor air pollution which is caused by human activities, equipments operation, furnitures&construction materials and outdoor pollutants.



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■ Silver nap

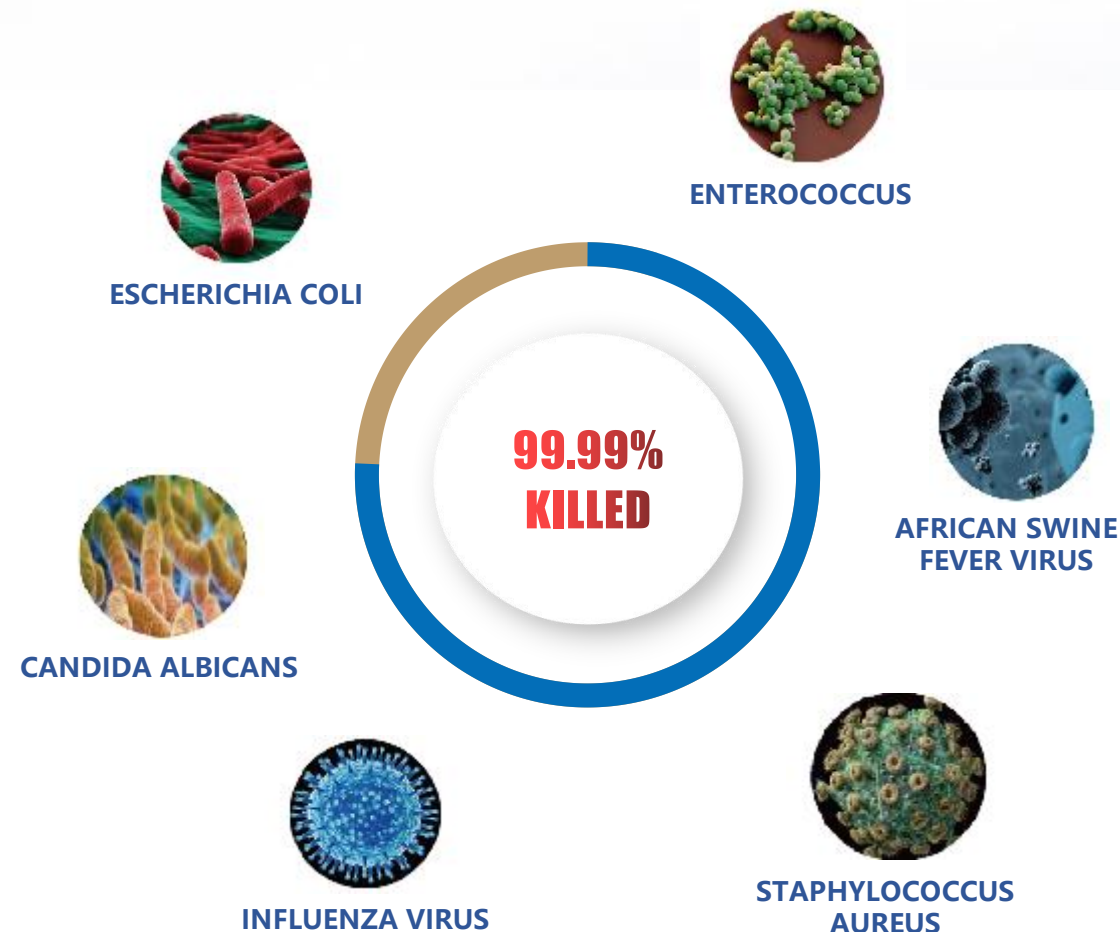
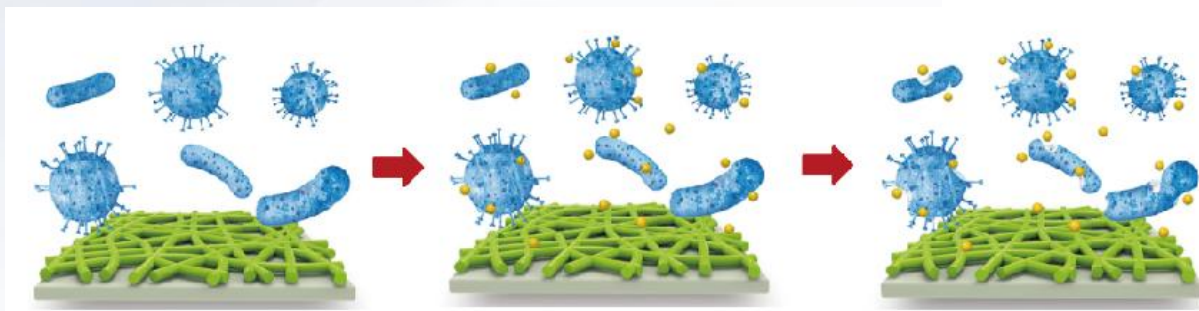
- Used in thermal sectors: Civil, Military, Sport cold-proof clothing and shoes/boots, etc.



ANTI BACTERIA/VIRUS TECHNOLOGY

BRIEF INTRODUCTION

- It is a kind of NanoFilttech independently R&D biological anti-bacteria/virus technology, by which we can graft the self-synthesizing free radical polymer active persad on the fabric layer of the filter media. The bacteria/virus will be killed instantly without blind spot when they touch the filtration media. And its period of validity is longer than the service life of the filter material.





IT IS A KIND OF TECHNOLOGY APPLIED TO MANY MATERIALS

The self-synthesizing free radical polymer active persad can be grafted onto various kinds of materials, including but not limited to the following chart. We also offer the experiment for the customization as per the requirement from our clients.

| | |
|--|--|
| NANOFIBER LAYER | PULP NONWOVEN FABRIC WOVEN BY AIR FLOW |
| PP MELT-BLOWN MATERIAL | WET-LAID NONWOVEN FABRICS |
| GREEN-WHITE COTTON | SPUN-BOND NONWOVEN FABRICS |
| ALL KINDS OF SUPPORT LAYER OF FILTER CLOTH | HYDROPHILIC NONWOVEN FABRICS |
| SPUN-LACED NONWOVEN FABRICS | NEEDLE PUNCHING NONWOVEN FABRICS |
| HEAT COMPOUND NONWOVEN FABRICS | CARBON FILTER CLOTH |



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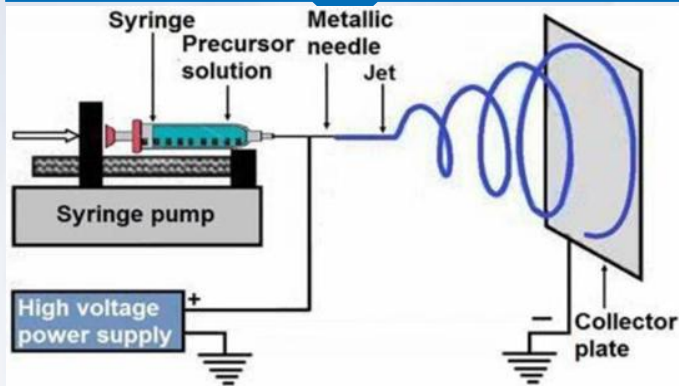
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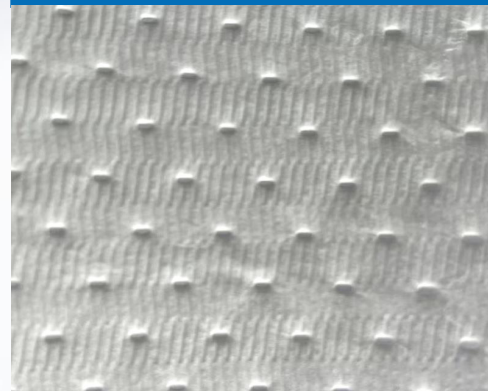
BRIEF INTRODUCTION

The high-efficiency and high-throughput nanofiber liquid filtration material is a kind of composite filter material developed for the removal of water and impurities in fuel (diesel), industrial oil-wet liquids such as heavy aromatics, hydraulic lubricants and other liquids. The key point is that the nanofiber layer has better management ability for water and particulate matter. The porosity is >85%.

Electrospun nanofiber



Media sample



| Type | Average aperture (μm) | Maximum aperture (μm) | Minimum aperture (μm) |
|---------|-----------------------|-----------------------|-----------------------|
| FRB5030 | 1.6 | 4.77 | 1.56 |

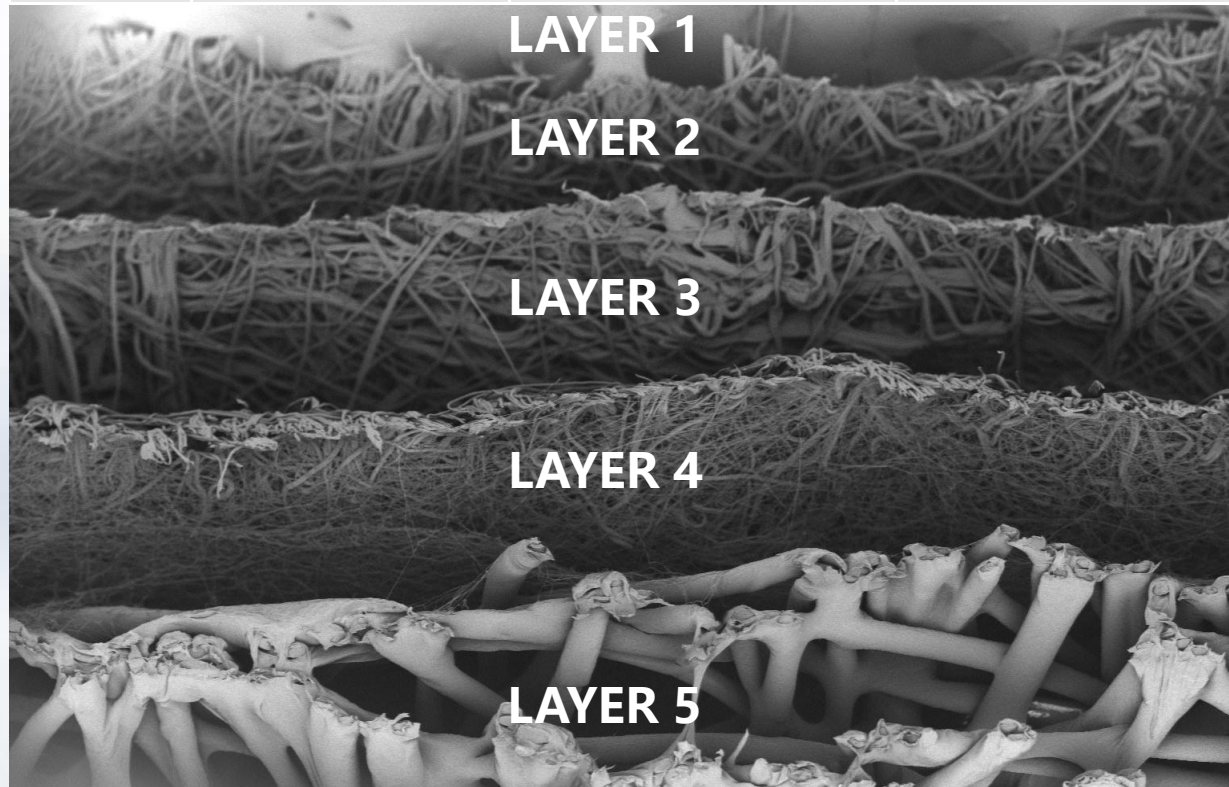
LAYER 1

LAYER 2

LAYER 3

LAYER 4

LAYER 5



Oil&water mix

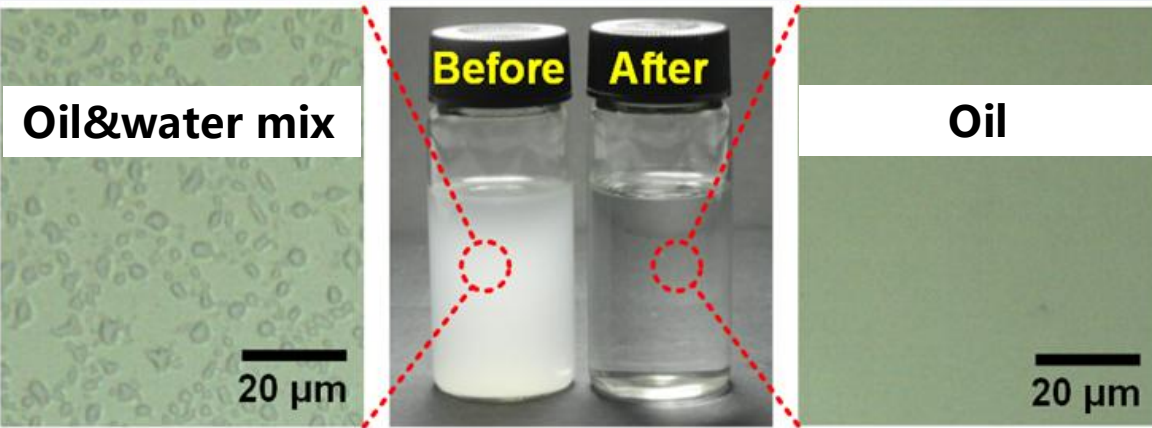
Before

After

Oil

20 μm

20 μm



ADVANTAGES BY COMPARASION

HIGH POLLUTANT PROOF ABILITY 

HIGH EFFICIENCY 

HIGH THROUGHPUT 

LONG LIFESPAN 

HIGH ACCURACY 

LOW RESISTANCE 

GOOD REUSABILITY 

GREAT HEAT STABILITY 

| Material | Oil-water separation efficiency (%) | Throughput (L/m ² h) | Product feature | Market |
|---|-------------------------------------|---------------------------------|---|--|
| Normal cellulose filter cloth | 75±5 | 650±30 | Low separation accuracy | Low market |
| Fiberglass filter cloth | 97±2 | 380±30 | High accuracy Lowest throughput Highest resistance | Special industries |
| Nonwoven/Cellulose filter cloth | 95±3 | 560±40 | High pollutant proof ability; High accuracy; Low throughput; High resistance | Mid& High markets but gradually cannot meet the needs of clients |
| NanoFilttech liquid separation filter cloth | 99.3 | 956 | | Mid& High markets due to its high performance and low price |

TDS FOR LIQUID SEPARATION MEDIA

| Product name | Function | Weight (g/m ²) | Thickness (mm) | Maximum/Minimum aperture (μm) | Average aperture (μm) | Fiber diameter (nm) | Particles filtration efficiency (%) | Particle content before filtration (quantity/ml) | Particle content after filtration (quantity/ml) | Water content before filtration (quantity/ml) | Water content after filtration (quantity/ml) | Throughput (L/m ² ·h) |
|--------------|----------------|----------------------------|----------------|-------------------------------|-----------------------|---------------------|-------------------------------------|--|---|---|--|----------------------------------|
| FRB5030 @1μm | particle-water | 190±5 | 1.00±0.02 | 4.77/1.56 | 1.62 | 200-600 | 99.5 | 25346 | 99.72 | / | / | > 945 |
| FRB5035 @5μm | particle-water | 187±3 | 0.92±0.02 | 8.7/2.6 | 4.3 | 200-400 | 99.1 | 13281 | 110.7 | / | / | > 1850 |
| FRB5018 | Oil-water | 160 | 1.02±0.05 | 7.6/3.3 | 3.4 | 100-600 | 97.47 | / | / | 2743 | 69 | > 1270 |

Test method:

1, For FRB5030&FRB5035, this test is A laboratory self-test. A3 powder and No. 0 diesel are configured with solid-liquid mixture. After being filtered by the filter device from position A to position B (total flow rate 50ml) (initial pressure about 0.5KPa), then measured the particulate matter content before and after filtration with the particulate matter counter, and calculated the interception efficiency;

2, For FRB5018, this test is A laboratory self-test. Pure water and No. 0 diesel oil mixed and filtered by the filter device at a height of 10cm (pressure about 0.85KPa), then measured the water content before and after filtration with the cassette moisture tester and calculated the filtration efficiency.



APPLICATION



ENGINE OIL FILTRATION



HYDROLIC FILTRATION



COKING CHEMICAL WASTEWATER TREATMENT



REFINERY DIESEL OIL SEPARATION

AND MANY OTHER ACCURATE APPLICATIONS IN MAHINING, CHEMICAL, REFINERY AND MINING INDUSTRIES, ETC.....



PRODUCTS&APPLICATIONS FOR NANOFILTECH FILTRATION MATERIALS



PART OF APPLICATIONS AND SUPPLY

| | | | | | | | | | | |
|---------------------------------|--------------|--|--------------------|-------------|-----|-----------------------|--------------------|---------------------------------|-----------------------|-------------------|
| | | | | | | | | | | |
| plate filter | bag filter | box filter | HEPA | PTFE | FFU | EFU | carbon filter | Particle filled chemical filter | automatic roll filter | |
| | | | | | | | | | | |
| High efficiency air supply port | BIBO system | High temperature resistant coarse filter | Liquid tank filter | RABS system | EAC | Ceiling type purifier | Household purifier | Commercial purifier | Fresh air purifier | oil fume purifier |
| | | | | | | | | | | |
| Photocatalytic purifier | dust remover | catridge filter | oil mist filter | | | | | | | |



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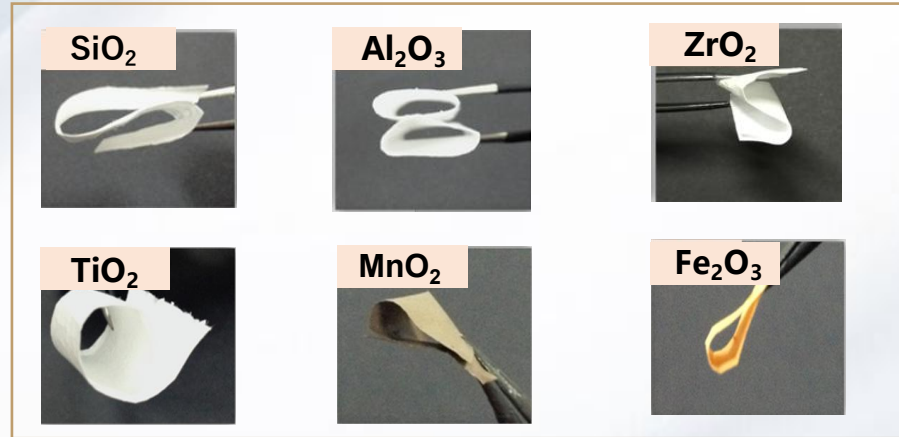
ULTRA-LIGHT THERMAL WADDING

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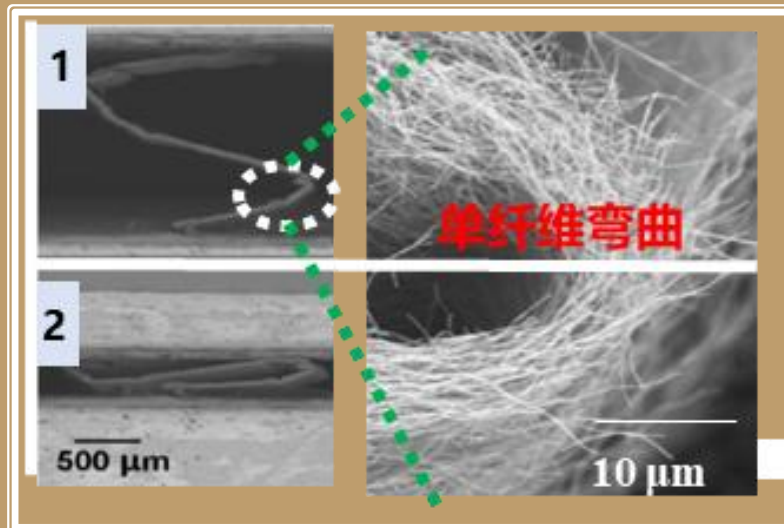
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NANOFILTECH NANOFIBER CERAMIC INSULATION MATERIAL

ELECTROSPUN
NANOFIBER
TECHNOLOGY

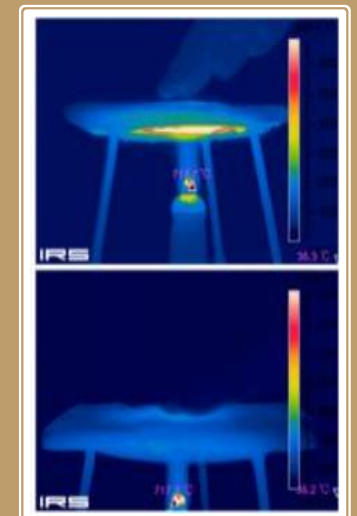


FINISHED PRODUCT



CORE ADVANTAGES

- SINGLE FIBER DIAMETER 100-300nm;
- EXCELLENT HEAT INSULATION PERFORMANCE;
- THICKNESS RANGE 0.5mm-30mm;
- OPERATION TEMPERATURE IS UP TO 1100°C;



INTRODUCTION OF COMPETITIVE PRODUCT- AEROGEL FIBROFELT

- ❑ Aerogel fibrofelt which is filled with aerogel powder is the top high temperature insulation material in the world. It is widely used in some of the high-end manufacturing. Aspen and Cabot are top companies in aerogel powder manufacturing industry.



aspen aerogels[®]
A SUBSIDIARY OF NASA

WORLD TOP AEROGEL
MATERIAL COMPANY

CABOT

THE FEATURE OF THE AEROGEL FIBROFELT

ADVANTAGES

- Filled with aerogel powder;
- Great high temperature insulation performance;
- Minimum thickness 5mm;
- Operation temperature is at 650°C

DISADVANTAGES

- × Poor bendability;
- × Powder is easy to fall off in dynamic condition. Powder shedding rate is > 2%
- × Super high price;
- × Not suitable for the operation condition above 650°C;



COMPARASION WITH AEROGEL PRODUCTS IN THE MARKET

| COMPANY | PRODUCT | THICKNESS (mm) | DENSITY (kg/m ³) | HEAT CONDUCTIVITY (W/m·K) | OPERATION TEMPERATURE (°C) | PRICE (\$/m ²) |
|----------------|------------------|-------------------|---------------------------------|---------------------------------|----------------------------------|-------------------------------|
| Aspen | Pyrogel-XTE | 5-30 | 80-200 | 0.019~0.020 | 650 | 21.4-86 |
| JIOS | Armagell | 5~20 | 160~240 | 0.019~0.020 | 650 | 18.6-83 |
| Cabot | Opacified Infill | 5-30 | 70-200 | 0.019~0.020 | 650 | 21.4-129 |
| Active Aerogel | Aeroflex | / | 100~260 | 0.019~0.020 | 650 | 17.2-72 |
| NanoFiltech | NFC025 | 0.5~30 | 50~100 | 0.03~0.032 | 1100 | 10-29 |

COMPARASION WITH OTHER HEAT INSULATION MATERIAL IN THE MARKET

| PRODUCT NAME | ADVANTAGE | DISADVANTAGE |
|---------------------------------------|--|--|
| SUPER FINE FIBERGLASS WOOL | Light weight, low thermal conductivity, good thermal insulation and sound absorption performance, corrosion resistance, heat resistance, frost resistance, earthquake resistance, high moth resistance, good chemical stability; | Easy to damage, need to add protective layer; The fibers fall off easily and irritate the skin, eyes and respiratory tract. |
| HIGH SILICA COTTON | Low thermal conductivity; good thermal stability, chemical stability and sound absorption; non-corrosive substance. | Poor compression and folding resistance, easy to generate the dust. |
| VACUUM INSULATION PANEL | Low thermal conductivity, down to 0.004W(m•K) at room temperature; thin thickness, less volume, light weight | The core material cannot be compressed as a whole in a vacuum environment; if the vacuum leaks, the thermal conductivity would increases instantaneously. |
| FILTROFELT FILLED WITH AEROGEL POWDER | Filled with aerogel powder, low thermal conductivity, excellent thermal insulation performance; good high-temperature resistance(up to 650°C) | High brittleness, poor bendability; the powder is easy to fall off in dynamic conditions; needs to be combined with other materials; high material cost; can not be used in the environment above 650°C. |
| POLYFOAM | Low density, light weight, high specific strength. It has the ability to absorb shock load, has excellent cushioning and damping performance, low thermal conductivity, good thermal insulation performance, and its strength increases with the increase of density. | Can not be compared with solid plastics in tensile strength; chemical stability and aging properties are related to the material. |
| NANOFIBER CERAMIC MEMBRANE | Low thermal conductivity, good heat insulation effect; the same insulation effect, thinner thickness and lighter weight than other materials; stable performance; good fire resistance; good plasticity; good impact resistance; the composition is inorganic material with long service life. | / |

TDS AND APPLICATIONS

| Item | Unit | Testing result |
|-------------------------------|-------|------------------|
| Testing material | / | SiO ₂ |
| Thickness | mm | 0.5-30 |
| Density | Kg/m3 | 50-100 |
| Heat conductivity coefficient | W/mk | ≤0.032 |
| Operation temperature | °C | -200~1100°C |
| Flame retardant performance | / | UL94V0 |



Electric vehicle body&battery protection



Fire fighting& Building protection



Aviation&Aerospace



Dangerous goods storage&transport



Military industry



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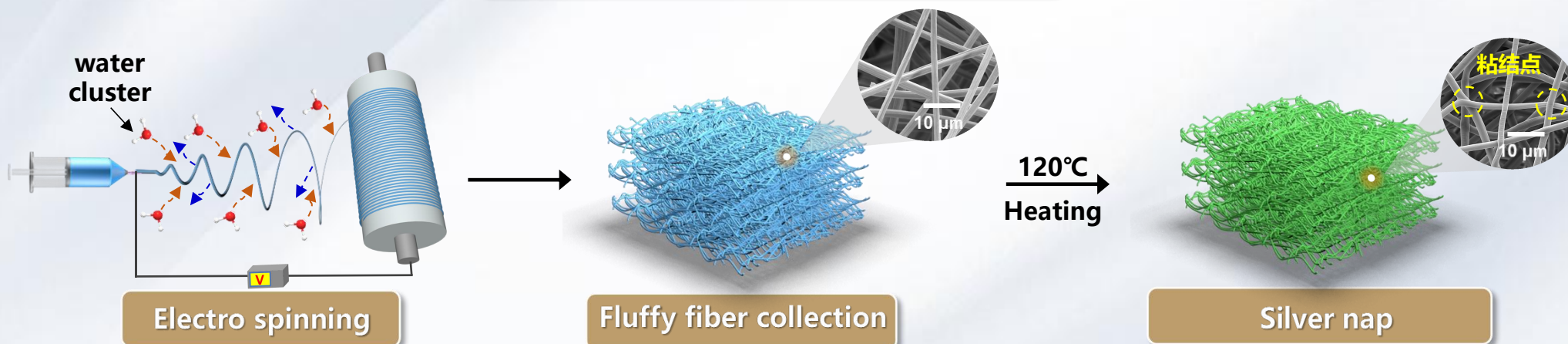
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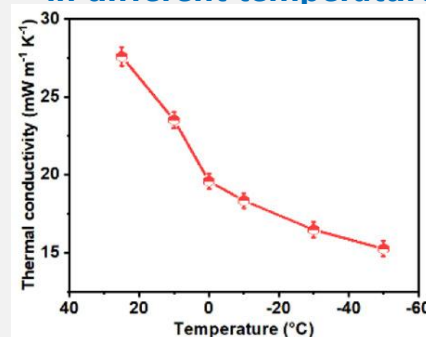


SILVER NAP

PRODUCTION METHOD



Heat conductivity coefficient in different temperature



Super low heat conductivity coefficient in low temperature

Comparison of thermal performance

| Thermal material | Weight (g/m ²) | Heat resistance (m ² •K/W) |
|------------------|----------------------------|---------------------------------------|
| 3A down flake | 120 | 0.37 |
| Silver nap | 120 | 0.66 |



PERFORMANCE COMPARASION BETWEEN SILVER NAP AND PRODUCTS IN THE MARKET

| PRODUCT NAME | WEIGHT (g/m ²) | HEAT RESISTANCE TESTED BY THIRD PARTY (m ² •K/W) | |
|-----------------------|----------------------------|---|--|
| | | BEFORE WATER SCRUBBING | AFTER WATER SCRUBBING |
| QUILTED DOWN-3A | 120 | 0.368 | / |
| QUILTED DOWN-4A | 120 | 0.438 | / |
| QUILTED DOWN-5A | 120 | 0.456 | / |
| QUILTED KANGDA D-DOWN | 120 | 0.350 | Exfoliation of the layers, fiber fall off partly, cannot continue to test the HR value |
| QUILTED 3M-EP | 120 | 0.376 | Exfoliation of the layers, fiber fall off partly, cannot continue to test the HR value |
| QUILTED SILVER NAP | 120 | 0.658 | 0.58 |

INTHE SAME CONDITION, THE HEAT RESISTANCE PERFORMANCE OF THE SILVER NAP IS ALREADY BETTER THAN 5A LEVEL DOWN.



TDS OF SILVER NAP

| PRODUCT NAME | WEIGHT (g/m2) | WIDTH (mm) | HEAT RESISTANCE (m ² •K/W) | WASHABLE RESISTANCE | BULKING VALUE (cm3/g) | COMPRESSIBILITY (%) | REBOUND RATE (%) |
|--------------|---------------|------------|---------------------------------------|---------------------|-----------------------|---------------------|------------------|
| FRB-BR120 | 120±5 | 3100 | 0.658 | QUALIFIED | 78 | 73 | 97 |
| FRB-BR150 | 150±5 | 3100 | 0.725 | QUALIFIED | 69 | 74 | 96 |
| FRB-BR250 | 250±5 | 2300 | 0.959 | QUALIFIED | 63 | 76 | 96 |

More than 20% lighter than 3A down flake; High fluffy structure; High anti- drill performance, no clumping;



Super higher heat resistance than other market popular materials; Slower heat transferring;

High water washable performance, High humidity resistance, machine washable;



SILVER NAP COOPERATION

INSULATED COAT

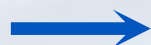


SAMPLE JACKET HAS BEEN
FINISHED AND TESTED WITH
ANTA GROUP

| Product name | Weight (g) | Clo value (clo) |
|-------------------|------------|-----------------|
| Puffer coat | 674 | 0.69 |
| Silver nap jacket | 551 | 0.83 |

In the same condition

The clo value of silver nap increase **20%** and the weight
decrease **18%** than the down.



INSULATED BOOTS

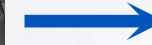


SAMPLE BOOTS HAS BEEN
FINISHED AND TESTED WITH
JIHUA GROUP

| Material | Weight (g/m ²) | HR (m ² K/W) |
|------------------------|----------------------------|-------------------------|
| Cold-proof cotton felt | 414 | 0.15 |
| Quilted silver nap | 229 | 0.21 |

In the same thickness

The HR of silver nap increase **40%** and the weight
decrease **45%** than the cold-proof cotton felt.



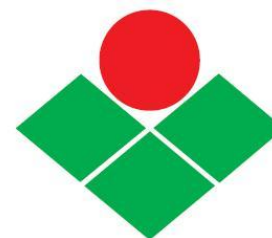


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BOE



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2023

THANK YOU



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Stanley Zhang
Director of International sales

CONCENTRATION TO INNOVATION FOR REVOLUTION