



NETT[®]TEX

PTFE Filament Yarn and Their Products Product Manual

PTFE Sewing Thread

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SUZHOU NETT NEW MATERIAL
TECHNOLOGY CO.,LTD

Company Profile

Suzhou NETT New Material Technology Co.,Ltd is located in the famous economic center of China, the Yangtze River Delta. ——Daxin Town, Zhangjiagang City, Suzhou City.

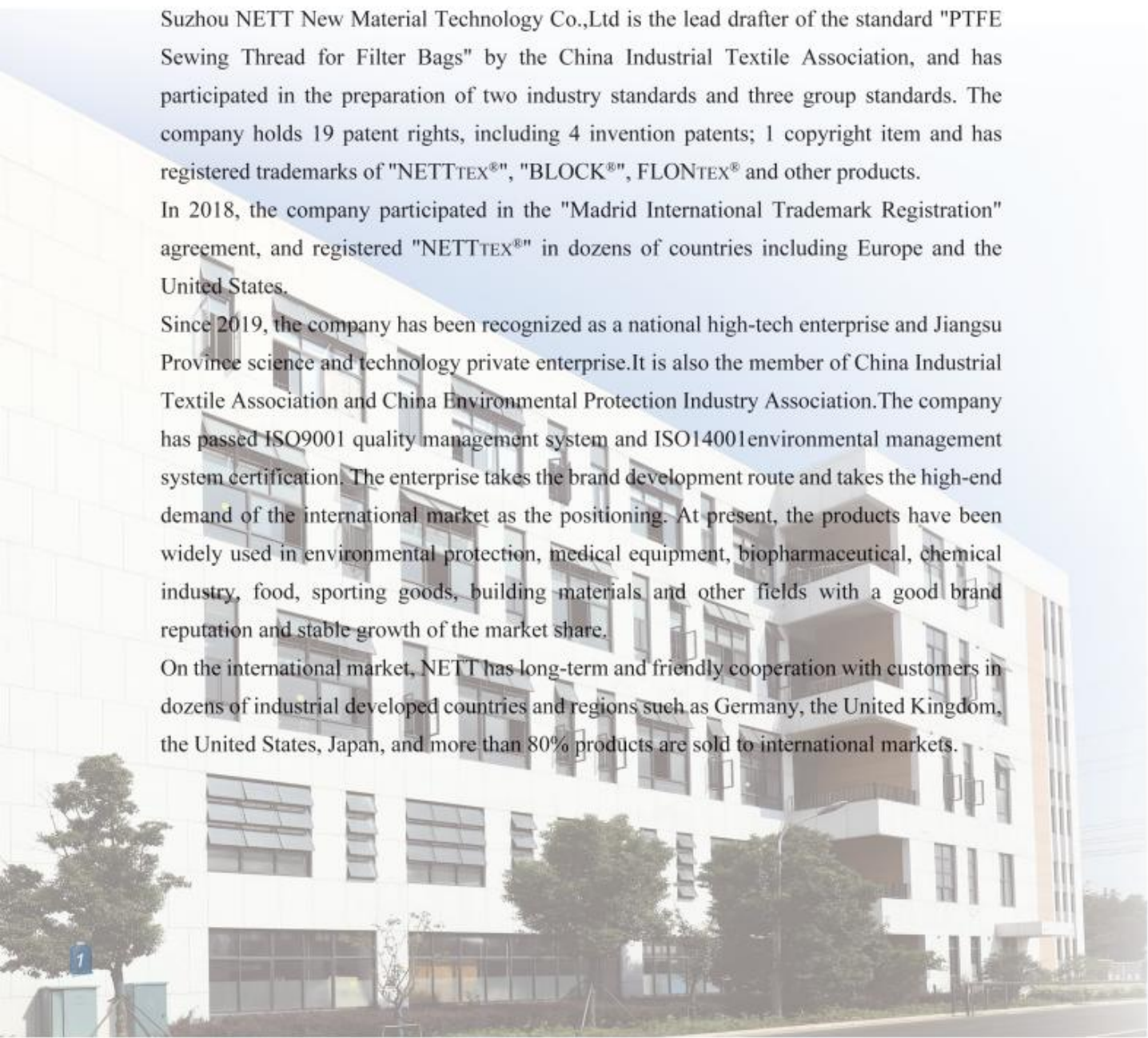
Company is a professional physical enterprise (factory) that integrates the research and development, production, and sales of fluoropolymer textile materials. At present, it has an annual production capacity of 300 tons of PTFE filament and 100 tons of PVDF multifilament. The products include PTFE sewing thread, textile filament yarn, monofilament, woven fabric, needle punched felt and etc., with a production value of up to 10 million US dollars.

Suzhou NETT New Material Technology Co.,Ltd is the lead drafter of the standard "PTFE Sewing Thread for Filter Bags" by the China Industrial Textile Association, and has participated in the preparation of two industry standards and three group standards. The company holds 19 patent rights, including 4 invention patents; 1 copyright item and has registered trademarks of "NETTTEX®", "BLOCK®", FLONTEX® and other products.

In 2018, the company participated in the "Madrid International Trademark Registration" agreement, and registered "NETTTEX®" in dozens of countries including Europe and the United States.

Since 2019, the company has been recognized as a national high-tech enterprise and Jiangsu Province science and technology private enterprise. It is also the member of China Industrial Textile Association and China Environmental Protection Industry Association. The company has passed ISO9001 quality management system and ISO14001 environmental management system certification. The enterprise takes the brand development route and takes the high-end demand of the international market as the positioning. At present, the products have been widely used in environmental protection, medical equipment, biopharmaceutical, chemical industry, food, sporting goods, building materials and other fields with a good brand reputation and stable growth of the market share.

On the international market, NETT has long-term and friendly cooperation with customers in dozens of industrial developed countries and regions such as Germany, the United Kingdom, the United States, Japan, and more than 80% products are sold to international markets.



PTFE Sewing Thread

NETTTEX® PTFE sewing thread products, using "plunger extrusion" production of round filament or "membrane split" production of flat filament, after twisting, compositing, heat setting and other processes, with good linear density uniformity and fracture strength. Sewing thread can be made from single ply or multi-ply, with linear density specifications ranging from 100 dtex to 8000 dtex.

PTFE sewing thread is widely used in various fields such as air filtration ,liquid filtration, mining powder collection, chemical, medical, construction and etc due to its excellent functional characteristics such as chemical corrosion resistance, temperature resistance, and hydrolysis resistance.

It should be reminded that during using or after waste collection, this product must not be burned with flames to avoid the generation of harmful gases to human health or the environment.

NETTTEX® PTFE Sewing thread products are guaranteed to be "Zero Knot" and made using "original filament" without any bonding or splicing methods to increase the length on purpose. In order to ensure the continuous high speed sewing and safety of the filter bag.

Example, dedicated to filter bags 1350dtex (1200D) technical parameters of PTFE sewing thread:

Technical parameters of PTFE Sewing thread

Model : ST-EF/1350/3 -a (1200D)

| NO | Item | Parameter | Test temperature | Notes |
|----|---------------------|--------------|---------------------|-----------|
| 1 | linear density | 1350±50dtex | Ambient temperature | 1200D |
| 2 | Breaking strength | ≥36N | Ambient temperature | |
| 3 | Breaking tenacity | ≥2.66cN/dtex | Ambient temperature | 3cN/den |
| 4 | Elongation at break | 4~10% | Ambient temperature | |
| 5 | Heat shrinkage rate | ≤3% | 260℃/2h | |
| 6 | Yarn | 3 | | |
| 7 | Direction of twist | Z | | |
| 8 | Weight/meter | 0.135g/m | | |
| 9 | Net Weight /Spool | 800~1000g | | Zero Knot |
| 10 | Color | Raw white | | |



PTFE Color Sewing Thread

NETTTEX[®] Color sewing thread, made by adding nanoscale fluorobased pigments to PTFE dispersion resin. While maintaining the excellent characteristics of PE temperature resistance and corrosion resistance, the product has the characteristics of full color, oxidation resistance, ultraviolet irradiation resistance (not easy to lose color) and so on.

NETTTEX[®] color sewing thread is mainly used for filter bags, industrial powder collection filter bags, liquid filter cartridges, drying nets, or brand identification lines; It can also be used to sew sailing sails and building awning tarpaulin.

The linear densit of NETTTEX[®] Color sewing thread is the same as the natural color sewing thread. The color can be customized.

Example, 3300dtex (3000D) technical parameters of color sewing thread:

Technical Paramenters of PTFE Color Sewing Thread (Extruded Filament)

Type CST-EF/3300/6-a (3000D)

| NO. | Item | Parameter | Testing Environment | Remarks |
|-----|---------------------|--------------|----------------------|-----------|
| 1 | Linear density | 3300±150dtex | Constant Temperature | 3000den |
| 2 | Breaking strength | ≥80N | Constant Temperature | |
| 3 | Breaking tenacity | ≥2.4cN/dtex | Constant Temperature | |
| 4 | Breaking Elongation | 4~8% | Constant Temperature | |
| 5 | Heat Shrinkage | ≤3% | 260℃/2h | |
| 6 | Net Weight/Spool | 600~900g | | Zero Knot |
| 7 | Length/kg | 3000±450m | | |
| 8 | Yarn | 6 | | |
| 9 | Colour | Black | | |



PTFE Monofilament Sewing Thread

NETT[®]TEX PTFE monofilament sewing thread, It is a product developed for biopharmaceutical, fine chemical filtration, and medical fields. The product has the characteristics of non fuzzing, softness, and strong wear resistance, the surface distribution has regular shallow grain. After appropriately increasing the surface roughness of the monofilament, the sewing stitches are more dense. Meanwhile, wear resistance of the thread is also increased.

The linear density specification of monofilament sewing thread is from 100dtex to 800dtex, which has the characteristics of high strength and low elongation.

Example: Technical parameters of 500D PTFE monofilament sewing thread:

Technical Parameters of PTFE 550dtex Monofilament (Extruded Monofilament)

Type : FF-EF/550/1-a

| NO | Item | Parameter | Testing Environment | Remarks |
|----|---------------------|-------------------|----------------------|--------------|
| 1 | Density | 550±50dtex ±5% | Constant Temperature | 500den |
| 2 | Linear diameter | 0.15mm | | |
| 3 | Breaking strength | ≥20N | Constant Temperature | |
| 4 | Breaking tenacity | ≥3.63cN/dtex | Constant Temperature | |
| 5 | Elongation at break | 4~8% | Constant Temperature | |
| 6 | Heat Shrinkage | ≤3% | 260℃/2h | |
| 7 | Net Weight/Cone | 500±10g | | Plastic Pipe |
| 8 | Length/kg | About 9000m | | Knot≤2 |



BLOCK[®] PTFE Composite Sewing Thread (Special Dust Filter Bag)

PTFE composite sewing thread is a specialized sewing thread for filter bags, which is made by spinning PTFE monofilament and heterogeneous material yarn with similar performance. It is a new product with independent intellectual property developed by NETTcompany (ZL 201610570877.3 ZL 201620763157.4) .In November 2023, it was rated as a "world advanced" product by the China Textile Federation.

The main purpose of developing filament and yarn composite sewing threads is to improve the performance defects of PTFE. Due to the physical properties defects of thermal creep, low friction coefficient, and poor wear resistance of PTFE, as well as the smooth surface of this sewing thread made of monofilament, it is not easy to seal the needle holes which will be affected the filtration efficiency.

BLOCK[®] Composite thread is made by combining PTFE monofilament with high-performance yarns such as PPS,POD,Aramid, PI and etc through textile processes such as wrapping or double lamination. It can be used to sew different high-temperature resistant filter media, such as PPS felt, aramid felt, fiberglass filter media, and various high-performance fiber composite filter media.

Compared to regular PTFE sewing thread, it has significant improvement functions:

- 1)Reduce the risk of filter bag damage and failure caused by thermal creep in pure PTFE sewing thread. PTFE has significant thermal creep and experiments have shown that PTFE sewing thread exhibits strong strength attenuation or even failure at a certain temperature.But in this product, due to the different thermal expansion properties of the composite yarn material compared to PTFE, the yarn with a lower coefficient of thermal expansion can effectively compensate for the strength attenuation caused by PTFE thermal creep, allowing the sewing thread to maintain a certain strength under high temperature conditions, thereby avoiding the risk of filter bag damage and falling.
- 2)Increase the sewing friction coefficient and enhancing the adhesion of filter media: The surface of the composite seam has increased roughness due to the feather of the yarn, thereby increasing the friction coefficient of the sewing thread which can be held more firmly with the filter material, which is conducive to locking the pinhole and improving the service life of the filter bag.

3) Enhance the surface wear resistance of sewing thread. The yarn with feather has a definite protective effect on PTFE monofilament, thus increasing the wear resistance of sewing thread. It can effectively reduce the risk of the sewing thread being broken off in the part touching with the sheet hole, cage and bag house.

4) Improve the sealing effect of the needle holes in the filter bag. The feather on the composite surface of the composite thread not only helps to form a firm hug with the filter material, but also helps to form a firm dust agglomeration to increase the filtration efficiency. Composite sewing line has a significant effect on reducing the needle hole dust penetration and improving the filtration efficiency.

Technical Parameters of PTFE/PPS Composite Filter Bag Sewing Thread

Type : ST-C-PTFE&PPS/1900/4 -a

| No. | Item | Index | Test Environment | Notes |
|-----|------------------------|---|--------------------|---------|
| 1 | Density | 190±100dtex | Normal temperature | 1700den |
| 2 | Breaking Strength | ≥36N | Normal temperature | |
| 3 | Breaking Tenacity | ≥1.9CN/dtex | Normal temperature | |
| 4 | Elongation at break | 11~15% | Normal temperature | |
| 5 | Heat Shrinkage | ≤3% | 260℃/15min | |
| 6 | Yarn | 4 | | 1+1/2 |
| 7 | Length per kg | 5200m | | |
| 8 | Net Weight/Cone | 500~800g | | |
| 9 | Weight per meter | 0.19 | | |
| 10 | Suggested Needle | 19# | | |
| 11 | Suggested filter media | PTFE/PPS composite filter material, PPS filter material | | |



PTFE Antistatc Composite Thread

NETTTEX® has developed the PTFE and stainless steel wire composite sewing wire, in order to effectively relieve the static electricity generated during the use of the filter bag during the dust or powder collection project.

Technical Parameter List of PTFE /SSW Sewing Thread

Type: ST-PTFE/SSW-2450/5-a

| NO. | Item | Paramete | Testing environment | Remark |
|-----|----------------------------|--------------|---------------------|------------|
| 1 | Linear density | 2450±100dtex | Room temperature | 2200 D |
| 2 | Breaking strength | ≥45N | <20 ℃ | |
| 3 | Breaking tenacity | ≥1.8cN/dtex | <20 ℃ | |
| 4 | Elongation at break | 6~10% | <20 ℃ | |
| 5 | heat shrinkage rate | ≤3% | 260℃/2h | |
| 6 | Yarn | 3+2 | | 3PTFE+2SSW |
| 7 | weight per meter | 0.250g/m | | |
| 8 | Weight per spool | 400~600g | | |
| 9 | Lenght/kg | 4000m | | continuous |
| 10 | Constant length resistance | 114.6Ω/m | 20℃, 25%RC | |

PTFE Filament Yarn

Due to the lack of liquid fluidity in the molten state of PTFE, traditional "melt spinning" processes cannot be used to produce PTFE filaments or monofilaments.

NETTTEX® PTFE monofilament is produced by the "plunger extrusion technology" round filament production technology and the "film split technology" flat filament technology, followed by processes such as twisting, merging, sintering, and redrawing to produce filament yarn or monofilament.

The monofilament yarn produced by the above two processes are made of circular or flat ones cross sections after the later treatment, both of which have the characteristics of high strength, wear resistance, flexibility, low elongation, low heat shrinkage and etc. The line density specification can be arbitrarily designed between 300 dtex to 10000 dtex. Products can be used to produce PTFE sewing thread, PTFE woven fabric, PTFE scrim for spunlace nonwoven felt.

We are kindly reminded that if it is used to produce PTFE scrim for spunlace felt, please choose the filament yarn produced by the "plunger extrusion technology" with a relatively high strength retention rate.



The following are the technical parameters of the conventional 550dtex(500D) PTFE filament yarn.

Technical Parameters of PTFE 550dtex Filament Yarn (Extruded Filament)

Type : FF-EF/550-a

| NO. | Item | Index | Testing Environment | Remarks |
|-----|---------------------|--------------|---------------------|--------------|
| 1 | Density | 550±50dtex | Normal Temperature | 500den |
| 2 | Line diameter | 0. 15mm ±5% | | |
| 3 | Breaking Strength | ≥18N | Normal Temperature | |
| 4 | Breaking Tenacity | ≥3.27cN/dtex | Normal Temperature | |
| 5 | Elongation at break | 4~8 % | Normal Temperature | |
| 6 | Heat Shrinkage | ≤3% | 260℃/2 h | |
| 7 | Net Weight/Cone | 500± 10g | | Plastic Pipe |
| 8 | Length per kgs | About 9000m | | ≤2 knot |

Technical Parameters of PTFE 550dtex Filament Yarn (Split-film Filament)

Type : FF-SF/550-a

| NO. | Item | Index | Testing Environment | Remarks |
|-----|---------------------|--------------|---------------------|---------|
| 1 | Density | 550±50dtex | Normal Temperature | 500den |
| 2 | Line diameter | 0. 15mm ±5% | | |
| 3 | Breaking Strength | ≥20N | Normal Temperature | |
| 4 | Breaking Tenacity | ≥3.63cN/dtex | Normal Temperature | |
| 5 | Elongation at break | 6~10% | Normal Temperature | |
| 6 | Heat Shrinkage | ≤3% | 260℃/2 h | |
| 7 | Net Weight/Cone | 500±10g | | |
| 8 | Length per kgs | About 9000m | | |

PTFE Monofilament

The round monofilament produced by the "plunger extrusion technology" or the flat monofilament produced by the "film split technology" can be directly processed with enhanced wear resistance to produce PTFE monofilament with different line density specifications between 100 dtex and 10000 dtex.

The PTFE monofilament produced by the above process can be used for weaving various industrial filter screens for medical equipment or medical equipment. Meanwhile it can also be used as monofilament sewing thread.

The following are the technical parameters of low denier 110dtex(100D)PTFE monofilament.

Technical Parameters of PTFE 110dtex Monofilament (Round Filament)

Type : FF-EF-110/1-a

| NO. | Item | Index | Testing Environment | Remarks |
|-----|---------------------|-------------|---------------------|--------------|
| 1 | Density | 110±10dtex | Normal Temperature | 100den |
| 2 | Breaking Strength | ≥4.2N | Normal Temperature | |
| 3 | Breaking Tenacity | ≥3.8cN/dtex | Normal Temperature | 4.2cN/den |
| 4 | Elongation at break | 4~6% | Normal Temperature | |
| 5 | Heat Shrinkage | ≤3% | 260℃/2 h | |
| 6 | Net Weight/Spool | 200±10g | | Plastic Pipe |
| 7 | Length per kgs | About18000m | | |
| 8 | Wire diameter | 0.075mm±5% | | |
| 9 | Knot | ≤4 | | |



PTFE Rope

NETTTEX® PTFE rope is an extension product of filament thread. Adopt filament knitting or thread knitting, rope reknitting process production, the rope has a dense appearance, stiff, no burr, feather. Products are used in aviation, chemical industry, clothing, marine aquaculture and other fields. NETTTEX® PTFE rope is designed according to the rope diameter and GSM standard which can design the rope diameter from 1mm~50mm. The gram weight specifications and strength requirements can be designed according to customer's requirements.

NETTTEX® can produce the color PTFE rope products according to the design.



PTFE Woven Fabric

NETT[®]TEX PTFE woven fabric is a derivative of PTFE filament and monofilament products. It can be customized according to the customer's requirements in gram weight, thickness, fracture strength, air permeability and other aspects. There are different weaving tissue structures such as flat, twill, satin and satin. The gram weight specifications can be selected between 300g and 1000g. By PTFE coating process or PTFE membrane lamination process, the filtration efficiency can be highly improved.

The following are the technical parameters of conventional specification PTFE woven fabric by 570g / m²:

Technical Parameters of PTFE Machine Woven Fabric

Product name: PTFE woven fabric

Specification: 570g/m²

| Material: PTFE | | | Weaving method: 2/2 (twill) | |
|---------------------------------|----------|-----------------|-----------------------------|-----------|
| Project | | Standard | Method | Index |
| Mass （g/m ² ） | | GB/T4669-1995 | TG328Aanalytical balance | 570±20 |
| width of cloth （cm） | | GB/T4667-1995 | tape measure | 100±2 |
| breaking strength (N/5x20cm) | Meridian | GB/T3923.1-1997 | HD026N（CRG） | ≥3900 |
| | zonal | | | ≥3300 |
| elongation at break(%) | Meridian | | | ≤30 |
| | zonal | | | ≤20 |
| Warp Density （root/in） | | GB/T4668-1995 | Y511 Density mirror | 81 |
| latitudinal density （root/in） | | | | 64 |
| Yarn count (warp and weft) | | | YG(B)086A | 800D*800D |
| Notes | | | | |



DISCLAIMER

The accuracy of the data of this presswork is set according to our highest cognitive level. However, in any case, we will not be responsible for the data integrity. NETTTEX® will not give any guarantee and compensation to the data. Meanwhile, under any circumstance, the company will not assume any responsibilities and obligations of the data in this presswork. The technical specifications of all NETTTEX® products shall be subject to the sales contract.



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