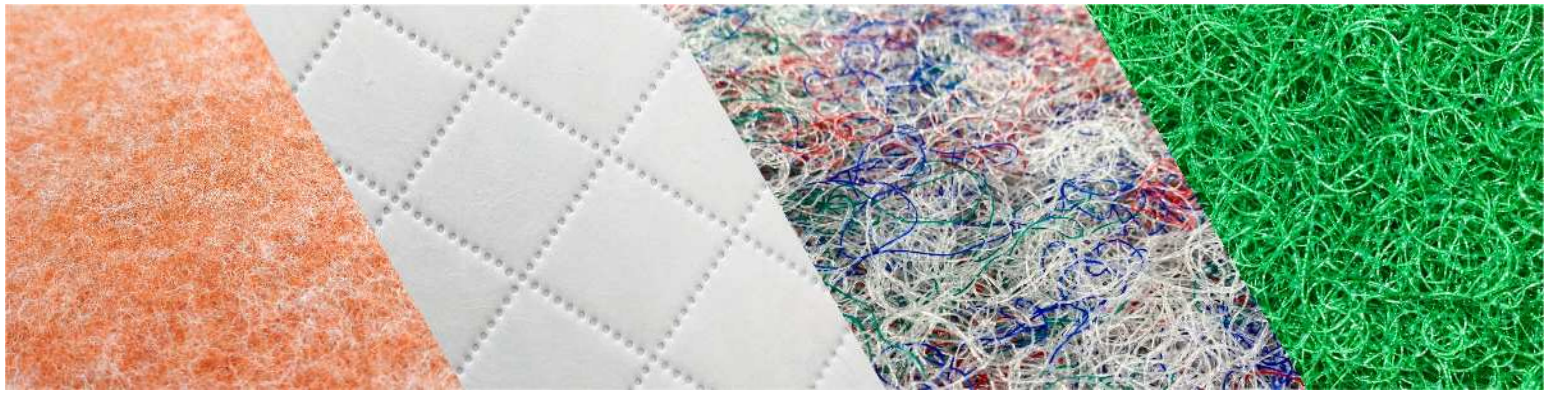
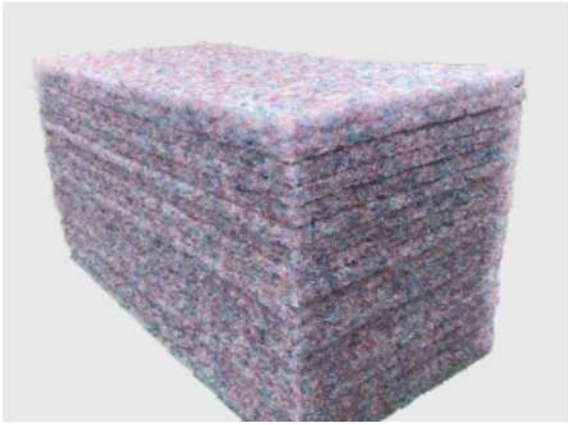
TOUKAI-
FUSYOKUFU

Toukai-Fusyokufu Co., Ltd.
(Toukai Nonwovens)
Shaping the Infinite Potential of Fiber



About

We are experts in nonwoven fabric manufacturing,
dedicated to exploring the limitless potential of fibers
to create a better way of life.



Today, nonwoven fabrics play an active role in every aspect of daily living.

By combining different raw materials and processing methods, they can be endowed with a wide variety of functions—truly a material full of possibilities.

Drawing on over half a century of accumulated experience, we will continue to support enriched lifestyles as
a company with vision and dreams that contributes to society.

Reasons why Toukai is chosen

-01- Support for small lots and short delivery times

We utilize technology for custom-made production to accommodate small lots and short delivery times.

-02- Unique products lineup

We are developing various unique products, starting with Lock materials.

-03- High-accuracy Ultrasonic Bonding Processing

We specialize in continuous Ultrasonic Bonding/welding processing using pin sonic machines.

-Facilities-

The numerous facilities held by Toukai-Fusyokufu Co. We utilize each opportunity according to the situation to provide optimal proposals tailored to our customers' needs.

Lock Line

This core production system enables the manufacture of three-dimensional reticulated structures through specialized technology.
It is used to produce coarse three-dimensional network structures for air and water filtration applications.
Drawing on many years of accumulated technical expertise, we are able to manufacture high-profile products with a large surface area and low airflow resistance.

Facilities

Needle Punch Line

Nonwoven Fabrics Tailored to Specific Applications

Raw materials for the nonwoven fabric are blended according to the intended application and fed into a carding machine.
As the cylinder rotates, thin fiber sheets are formed and layered, and through the vertical motion of needle punches, the stacked sheets are mechanically entangled to produce the fabric.

Main Production Equipment

- Carding Machine
- Needle Punching Machine
- Drying Oven
- Impregnation Line
- Spray Line
- DILO Needle Loom

Facilities

Pinsonic Line

Ultrasonic Welding Technology for Precision Pattern Design

In the Pinsonic line, nonwoven fabric—primarily spunbond—is fed between a metal patterned roll and an ultrasonic horn, where it is thermally bonded using frictional heat.
Any thermoplastic material can be processed.
In November 2024, the equipment was upgraded with several enhancements, including increased generator output, linear adjustment of horn amplitude, installation of a horn cooling system, automatic control of base fabric tension, and adjustable winding tension after processing.
These upgrades enable more uniform quality and the stable provision of high-precision ultrasonic bonding.

Equipment Capabilities

● Pattern Rolls

Design features can be imparted through the patterns engraved on the roll surface.
Currently, five pattern types are available:

Diamond pattern (1, 2, and 3 inch)

Herringbone pattern

Diamond checker pattern

● Bonding Area

2.5% to 10% (selectable according to application)

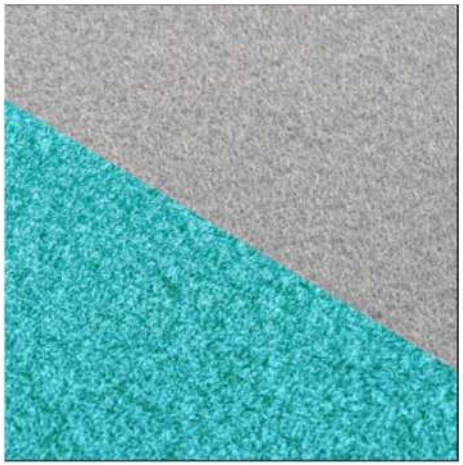
● Processing Capacity

Continuous ultrasonic bonding: up to 6 patterns / up to 6 layers

Processing width: 1,450 mm

Products

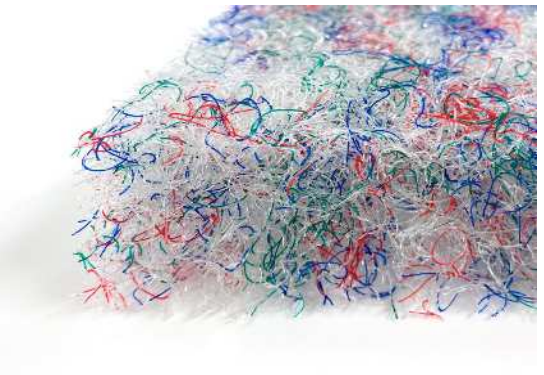
Through continual challenges, we have acquired unique expertise found nowhere else.
There are things that only we can do.
Our know-how cannot be fully revealed—
because it is the result of half a century of taking on every challenge without exception.
Built upon customer requirements, our accumulated knowledge and precision technologies
enable us to respond to a wide range of requests with confidence and flexibility.
Contact us to discuss your needs.



Needle Punch

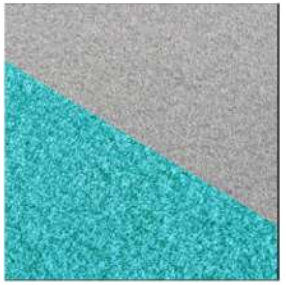
Pinsonic

Lock



TP Lock

Needle Punch Fabrics



•Used in **automotive interiors** (trunks, ceiling, deck boards)
•Polyester fiber web, optionally binder-treated
•Can be spray-finished, impregnated, or brushed

Versatile Nonwoven Material for Automotive Interior Applications

This is a **highly versatile nonwoven product** widely used in **automotive interior components**.
As raw materials, polyester fibers with fineness ranging from **2 to 30 dtex** are mainly used.
The fibers are formed into a web using a carding machine, then **multiple web layers are laminated and consolidated into a nonwoven fabric by a needle-punching process**.
Typical specifications include a **basis weight of 80–300 g/m²**, **thickness of 2–7 mm**, and **maximum width up to 1,800 mm**.
The product is commonly used for **automotive headliners, trunk linings, deck boards, and related interior components**.
Binder application is also available using both **spray lines and impregnation lines**.
The binder add-on can be adjusted from **5 to 100 g/m²**, and by blending various additives, **additional functional properties** such as improved performance or specific characteristics can be incorporated.
In addition, **napping (raising) processing using a DILO machine** is available to achieve a soft or textured surface finish.

Pinsonic Nonwovens

•Adhesive-free bonding via ultrasonic heat welding
Easy separation for recycling, environmentally friendly

Environmentally Friendly, Adhesive-Free Product

This is an **environmentally friendly product that requires no adhesives**.
By utilizing **ultrasonic welding**, materials with thermoplastic properties can be bonded **without the use of binders or chemical adhesives**.
As a result, the product can be **easily separated at the time of disposal** and is **fully recyclable**, making it a sustainable solution with reduced environmental impact.

Products

Lock

This porous, high-loft nonwoven fabric is bonded with a binder, providing a large specific surface area and low airflow resistance.
It is a versatile nonwoven material used in a wide range of applications, including industrial materials and civil engineering products.

Applications & Corresponding Products of TP-Lock and other Locks

● **HVAC & Air Handling Systems**

Air filters (pre-filters), droplet and noise attenuation media, mist separators, gas filters, mist separator / scrubber packing media, gas filter droplet & noise attenuation media, energy-saving cooling media for outdoor air-conditioning units
Compatible products: V-Lock, S-Lock, TP-Lock, Palm-Lock

● **Wastewater Treatment Media**

Rotating biological contact media, fixed-bed biological contact media, filtration filters (pre-filters)
Compatible products: V-Lock, S-Lock, TP-Lock

● **Industrial Materials**

Backing materials for abrasive products, electromagnetic wave absorbing substrates, paint booth filters
Compatible products: V-Lock, S-Lock, Palm-Lock

● **Aquaculture & Fisheries Applications**

Bio-submerged filtration media for freshwater fish, spawning mats, filtration media for seawater intake
Compatible products: V-Lock, S-Lock, TP-Lock

● **Ornamental Fish Filtration Media**

Bio mats for koi ponds, water-flow mats, circulation filters, freshwater and marine ornamental fish filters, marine fish filters
Compatible products: V-Lock, S-Lock, TP-Lock

● **Civil Engineering Materials**

Ground stabilization sheets, impermeable mats, bank protection sheets, slope greening mats
Compatible products: PET-Lock, V-Lock, Palm-Lock

● **Building & Construction Materials**

Gutter filters, rainwater infiltration mats, permeable sheets for rooftop greening systems
Compatible products: TP-Lock, V-Lock, PET-Lock

● **Custom Solutions**
Materials can be custom-designed and manufactured according to customer requirements, including **polymer type, fiber diameter, thickness, surface area, and structural properties**.

-Lock Product characteristics by material type-

Lock Name	Base Material	Specific Gravity (g/cm³)	Chemical Resistance	Flame Retardancy	Weather Resistance	Water Resistance	Water Absorption	Heat Resistance (° C)	Other Features
V-Lock	PVDC/PET (blend)	1.7	Excellent (acid-resistant)	PVDC side: high FR tendency; PET is combustible	Excellent	Excellent	None	80	Good elastic recovery
S-Lock	PVDC	ditto	ditto	High / self-extinguishing	ditto	ditto	ditto	≤80	
PET-Lock	PET (Polyester)	1.38	Excellent	Combustible	Excellent	Excellent	None	150	
T·P Lock	PP (Polypropylene)	0.91	Superior	None (FR treatable)	UV-treated items available	Excellent	None	130	No toxic gas on burning; floats
Palm Lock	Coconut Fiber	1	Fair	Combustible	Fair	Degrades	Present	150	—

-Lock Product characteristics by material type-

1. Standard of the V lock

Model Code	Basis Weight (g/m²)	Thickness (mm)	Bulk Density (g/cm³)	Porosity (%)	Surface Area (m²/m²)	Fiber Fineness (dtex)	Heat Resistance (° C)	Color Tone	Material	Other Features
6015	900	15	0.06	96.5	4.65	660–1150	80	Mixed	PVDC/PET	This is a lock material made by blending PET fibers with PVDC fibers, resulting in improved elasticity, strength, and a higher porosity. Its applications are similar to those of S-lock, but it is less expensive and is the most commonly used type in general.
5625	1400	25	0.056	96.8	7.23	660–1430	80	Mixed	PVDC/PET	
5030	1500	30	0.05	97.1	7.74	660–1430	80	Mixed	PVDC/PET	
5050	2500	50	0.05	97.1	12.9	660–1430	80	Mixed	PVDC/PET	

2. Standard of the S lock(PVDC)

Model Code	Basis Weight (g/m²)	Thickness (mm)	Bulk Density (g/cm³)	Porosity (%)	Surface Area (m²/m²)	Material	Fiber Fineness (dtex)	Heat Resistance (° C)	Color Tone	Other Features
7510	1125	10	0.112	93.5	5.49	PVDC	1150	80	Mixed	The PVDC fiber material is resistant to chemicals and is flame-retardant. Lock materials made from these fibers have a high porosity, resulting in very low resistance to the passage of air or liquids, and a very large surface area for particles and gases to collide with or be adsorbed onto. Applications include various types of filters, mist separators, water drop soundproofing materials, and filtration materials for aquaculture fish.
7515	1125	15	0.075	95.6	5.49	PVDC	1150	80	Mixed	
7525	1875	25	0.075	95.6	9.16	PVDC	1150	80	Mixed	
6050	3000	50	0.06	96.5	14.65	PVDC	1150	80	Mixed	
7550	3750	50	0.075	95.6	18.31	PVDC	1150	80	Mixed	
6025S	1500	25	0.06	95.6	7.12	PVDC	1150	80	Green	
6050S	3000	50	0.06	95.6	14.65	PVDC	1150	80	Green	

-Lock Product characteristics by material type-

3. Standard of the PET lock

Model Code	Basis Weight (g/m^2)	Thickness (mm)	Bulk Density (g/cm^3)	Porosity (%)	Surface Area (m^2/m^2)	Fiber Fineness (dtex)	Heat Resistance (° C)	Color Tone	Material	Application Note
NPB3225	**800**	25	0.032	98.12	**7.81**	60–1,000	80	Mixed	PVDC/PVC/PET	Paint booth exhaust filter (FR)
NPB2150	**1050**	50	0.021	98.76	**10.3**	60–1,000	80	Mixed	PVDC/PVC/PET	Paint booth exhaust filter (FR)

-Lock Product characteristics by material type-

4. Standard of the TP lock

Model Code	Basis Weight (g/m^2)	Thickness (mm)	Bulk Density (g/cm^3)	Porosity (%)	Surface Area (m^2/m^2)	Material	Fiber Fineness (dtex)	Heat Resistance (° C)	Color Tone	Application Note
3515TPM	500	15	0.035	96.2	6.8	PP	770	130	Mixed	**The intersections of the fibers are fixed into a three-dimensional structure by thermal bonding, without using any adhesives. This material is extremely lightweight and easy to handle. Even when burned, it does not emit toxic gases, and when buried in soil, it decomposes and corrodes, making it environmentally friendly. It also floats on water. Applications include water drop soundproofing materials, spawning floating reefs, mist separators, various filters, sand erosion prevention for racehorse training tracks, and cushioning materials.**
3025TPM	750	25	0.03	97.3	10.23	PP	770	130	Mixed	
2650TPM	1300	50	0.026	97.2	17.73	PP	770	130	Mixed	
3050TPM	1500	50	0.03	96.7	20.45	PP	770	130	Mixed	
2825TP	700	25	0.028	96.8	9.55	PP	770	130	Natural	
2450TP	1200	50	0.024	97	16.36	PP	770	130	Natural	

Feature 1　No-binder lock that does not use any adhesives. We provide highly precise and high-quality products.
The intersections of the fibers are fixed into a three-dimensional structure by thermal bonding, without using any adhesives. Thanks to thermal bonding, the strength is also sufficient. Furthermore, since it is a no-binder type and contains no chemicals, even if TP Lock is placed in water and stirred, no bubbles will form.

Feature 2 Environmentally friendly lock.
Since it is made of 100% olefin-based components, it does not corrode or decompose in the soil and cause pollution, allowing for semi-permanent use. Furthermore, the gases generated during combustion are non-toxic and non-polluting. Because it does not contain any foreign auxiliary materials, it can easily address environmental concerns.

Feature 3　Easy-to-handle ultra-lightweight performance lock
With a material specific gravity of 0.91 and a bulk density of 0.02 to 1 g/cc, it is extremely lightweight and easy to handle, greatly reducing the burden during work. In addition, since it floats on water, it also helps reduce the weight of other components, contributing to cost savings.

Feature 4　Good chemical resistance
Strong chemical resistance that is not affected by acids or alkalis.

-Lock Product characteristics by material type-

5. Standard of the other material										
Model Code	Basis Weight (g/m^2)	Thickness (mm)	Bulk Density (g/cm^3)	Porosity (%)	Surface Area (m^2/m^2)	Material	Fiber Fineness (dtex)	Heat Resistance (° C)	Color Tone	Application Note
FM-10	750	10	0.075	95.1	14.37	PVDC/PVC	60–120	80	Mixed	Filters, silencers, ornamental fish filtration
PET-500	500	20	0.05			PET	17–33	150	Green	Filters, silencers, ornamental fish filtration
S600	600	25–30	0.06–0.08			Coconut		150	Brown	Paint booth exhaust filters, etc.
S900	900	50				Coconut		150	Brown	Paint booth exhaust filters, etc.

TP-Lock
Environmentally Friendly, Resource-Efficient Material with Versatile Applications

TP-Lock offers a wide range of applications thanks to its environmentally friendly and resource-efficient characteristics.
Manufactured using an eco-conscious process, TP-Lock is widely adopted as packing media for exhaust gas treatment and wastewater treatment systems.

- **Key Features 1 – No-Binder Structure**
- TP-Lock is a **no-binder nonwoven material**, providing high precision and consistent quality.
- Unlike conventional products, TP-Lock uses **no adhesives whatsoever**.

  The three-dimensional structure is fixed by **thermal bonding at fiber intersections**, ensuring sufficient mechanical strength and long-term durability.
- Because no chemical binders are used, TP-Lock contains **no chemical additives**.

  Even when immersed and agitated in water, it **does not generate foam**, making it highly suitable for water treatment applications.

- **Key Features 2 – Environmentally Responsible Material**
- TP-Lock is made of **100% olefin-based material**, which does not corrode, decompose, or cause soil contamination.

  As a result, it can be used **semi-permanently** in long-term applications.
- Furthermore, gases generated during incineration are **non-toxic and non-polluting**.

  Since TP-Lock contains **no foreign or composite materials**, it is well suited to meet increasingly strict environmental regulations.

TP-Lock

Key Feature 3 – Ultra-Lightweight and Easy-to-Handle Lock Structure
TP-Lock features an **exceptionally lightweight structure**, with a material specific gravity of **0.91** and a bulk density ranging from **0.02 to 1.0 g/cm³**.
Its low weight makes handling extremely easy and **significantly reduces labor burden during installation and maintenance**.
In addition, TP-Lock **floats on water**, which helps reduce the load on surrounding components and contributes to **overall cost reduction** in system design and operation.

One of the Lightest Fiber Materials Available

Material	Specific Gravity
Polypropylene	**0.91**
Nylon	1.14
Polyvinyl Chloride (PVC)	1.39
Polyvinylidene Chloride (PVDC)	1.69
Acrylic	1.17
Polyester	1.38
Rayon	1.50
Cotton	1.54

TP-Lock

Key Feature 4 – Excellent Chemical Resistance

TP-Lock exhibits **excellent resistance to a wide range of chemicals**, including acids and alkalis, making it suitable for harsh chemical environments such as exhaust gas treatment and wastewater processing systems.

Evaluation Symbols
- ● : Excellent resistance / Suitable
- ▲ : Limited resistance (conditional use)
- × : Not resistant / Not suitable

Strong Resistance to Acids and Alkalis
Chemical Resistance Comparison by Material

Chemical	Polypropylene (PP)	Nylon	PVC	PVDC	Acrylic	Polyester	Rayon	Cotton
Sulfuric Acid	●	×	●	●	▲	▲	×	×
Nitric Acid	●	×	●	●	×	●	●	●
Hydrochloric Acid	●	×	●	●	●	●	▲	●
Glacial Acetic Acid	●	×	×	×	●	●	●	●
Caustic Soda (NaOH)	●	●	▲	▲	●	▲	●	●
Sodium Hypochlorite	●	●	×	×	●	●	●	●
Acetone	●	●	×	×	●	●	●	●
Dimethylformamide (DMF)	●	▲	×	×	×	×	●	●
Chlorobenzene	×	●	×	×	●	●	●	●
Xylene	×	●	-	-	●	●	●	●
m-Cresol	●	×	-	-	●	×	●	●
Ethyl Alcohol	●	●	●	●	●	●	●	●

Toukai-Fusyokufu Co., Ltd.

(Toukai Nonwovens)

Variants

- Needle Punch
- Pinsonic
- V-Lock (Vertical structure)
- S-Lock (Standard, PET/PVDC)
- PET-Lock (Heat-resistant, polyester)
- TP-Lock (Eco, PP, binder-free)
- Palm Lock (Natural fiber-based)

Certifications

- ISO 9001 Certified Manufacturing
- Compliant with international safety & environmental standards

Contact

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