Management concept

Company purpose

We contribute to the improvement of society through production, sales of good products and prosperity of business.

Company motto

We pride ourselves as a pioneer in the interior design and furnishing industry and persist in the spirit of cooperation, sincerity and resolution.

We put our management concept into practice on a daily basis and maintain high ethical standards in all aspects of our business operations, so as to continuously enhance Suminoe Textile's profile as a leader in its industry.

We have drawn up the Code of Conduct set out below to serve as the core principles of our compliance-based management, for observance by all officers and employees of the Company as individuals, and by the Company itself as a collective body.

Code of Conduct

1. **We comply with all laws and social norms and conduct corporate activities in an impartial and ethically sound manner.**
2. **We contribute to the advancement of the community through the production and sale of good quality products.**
3. **We treat all employees of the Company fairly, act with due respect for their individual personalities, and place high importance on their health and safety.**
4. **We place high priority on maintain good relationships with all our stakeholders.**
5. **We make proactive contributions to the community, as expected of a good corporate citizen.**
6. **We take very seriously the impact of our business activities on the global environment, and contribute to environmental preservation initiatives.**

Environmental fundamental philosophy

Recently deterioration of global environment has rapidly progressing.
It is a mission in common among human beings who live on earth to make efforts to preserve and improve global environment and hand the beautiful earth to our descendants.
Suminoe Textile Co., Ltd. well recognized this fact, will make a comfortable and rich society with a cooperation of all the employees positively tackling with environmental preservation activity.

Guideline on activity

In carrying out environmental conservation activities

1. **We will positively promote energy-saving, resource-saving, recycling with a consideration not to contaminate environment in all of our business activities.**
2. **We will try to preserve environment through products' life cycle from production, sales to disposal by developing environment-friendly technology and products.**
   1. Development of technology for energy-saving and resource-saving
   2. Development of recycling technology and recycling system
   3. Development of products and technology to replace materials which would put less load on environment and have more safety.
   4. Development of product which could improve environment and contribute to health and comfort.
3. **We will try to live together with community through close communication and all employees will start action from whatever one can do.**
4. **We will try to maintain internal system to promote environmental protection and enhance environmental consciousness of all employees.**

Greetings

"Resources for the future"

Looking ahead to the next 100 years

Japan's economic situation is currently at a turning point, amid the restraints on the electricity supply and the historic appreciation of the yen, which have driven a number of Japanese businesses to relocate their production bases overseas at a rapid pace. The United Nations Conference on Sustainable Development (Rio+20) held June 2012 advocated a "green economy" in an effort to achieve both environmental preservation and economic development. However, the gap between the standpoints of developed and emerging nations remains wide. There has been no substantial progress in setting numerical targets and specific goals.

In the meantime, biodiversity is being lost, and global warning is advancing; there is no time to waste in reducing greenhouse gas emissions. Given such a situation, the business sector is expected to assume a major role in the establishment of a sustainable society, both pursuing business success and making a contribution to environmental preservation transcending national borders, without sacrificing either of them.

"ECOS," a recycled carpet tile series developed by Suminoe Textile Co., Ltd., has received great appreciation for its environmental performance since its introduction to the market. ECOS is the first product to obtain Eco Mark certification in the category of carpet tile products, under new certification criteria revised in May 2012. The criteria newly adopt the concept of "horizontal recycling," requiring the use of recycled materials derived from waste carpet tiles at a rate of 10% or more of the total product mass. ECOS, in which recycled materials derived from waste carpet tiles are used as a backing, is the world's top eco-friendly product to achieve a recycled material content of up to 77%, enabling us to lead the industry in receiving Eco Mark certification under the new criteria. We are determined to continue our group-wide efforts to develop new products with less environmental impact, under the tagline, "Resources for the future."

In December 2013, Suminoe Textile will celebrate the 100th anniversary of its incorporation as a company. As a pioneering manufacturer in the Japanese interior industry, we will maintain our traditions handed down since our founding, and at the same time, we will look ahead and step forward towards the next 100 years, pursuing the enhancement of our corporate value by launching into a new growth field, and also contributing, through our products, to a reduction in the environmental burden and improvement in the well-being of society.

January 2013

Ichizo Yoshikawa
President
Suminoe Textile Co., Ltd.

Environmental-friendly technology development

Efforts for developing technologies

We always try to improve technologies based on the training of human resources so that we can reduce a load on environment throughout the life cycle from the production, use to scrap of products, and contribute to forming the sustainable society by harmonizing with nature.

While the development of technology to prevent public pollution or reduce a load on environment at the production stage was the main target so far, we are now tackling with the development of technologies not only to reduce a load on overall environment such as production, use and scrap stages, but also improve the environment of living space and offer products which could bring safety, security, health and comfort to people.

In this way our company is contributing to the society through “Environmental power” which is one of strong points of the company to develop products with low environmental impacts and low carbon-dioxide emissions for the achievement of the low carbon society.

Furthermore, our company has been participating in FY2010 Project to support enhancement of strategic fundamental technology of Ministry of Economy, Trade and Industry (METI) and also participating in FY2011 Project “Green Sensor Network with Low-Cost, Layout- and Maintenance-Free MEMS Sensors” of New Energy and Industrial Technology Development Organization (NEDO).

● Environmental technologies which Suminoe Group is approaching

Production stage	Use stage	Scrap stage	
Recycling technology & Recycle system (in-house wastes and recycling materials are target)	Technology to improve space living environment (Approach to health and comfort)	Recycling technology & recycle system (Used products are targets)	Technology to prevent pollution (Alternatives to used chemical substances are main targets)
Energy-saving technology / Resource-saving technology	Indoor environment improvement technology	Energy-saving technology / Resource-saving technology	Reduce technology of PRTR substance

Collaboration of academia, industry and government for product development

Ministry of Economy, Trade and Industry

FY2010 project to support enhancement of strategic fundamental technology

Development of durable high-functional fibers by electron beam irradiation induced graft polymerization

Ministry of Economy, Trade and Industry

public project ↓ ↑ proposal — selection

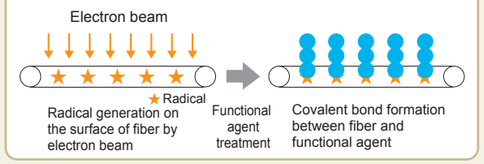
Suminoe Textile Co.,Ltd. Managing organization

Research organization / Kyoto Institute of Technology / University of Fukui (adviser)

Collaboration units

Electron beam irradiation induced graft polymerization

- High durability
- Treatment with stable fiber like aramid fiber



NEDO

Green Sensor Network System Technology Development Project

NEDO

public project ↓ ↑ proposal — selection

NMEMS Technology Research Organization Technology Research Association

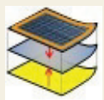
Tokyo Institute of Technology / Suminoe Textile Co., Ltd.

Joint research project with other 18 campanies and R&D Organizations

① Development of green sensor terminals with electrical generating module

Sensors the size of band-aids (2 cm×5 cm), mounted on flexible substrates

Stand-alone electric generating module with indoor ambient lighting and its storage modules



To develop revolutionary new sensor that incorporate wireless communication functions, stand-alone power source functions and ultra-low power consumption functions

② Development of green sensor network system

Construction of a network system in the laboratory and verification of energy-saving effect

Environmental-friendly technology and products

ECOS® ECOS Recycled Carpet Tiles

Resources for the future

ECOS is the first product to obtain new Eco Mark certification criteria.

Ecos has achived post-consumer recycled material ratio of up to 77 percent and reduced a higher amount of CO_2 emission than Suminoe's existing products by 40 percent or more in the LCA assessment.

Suminoe Textile Co.,Ltd. and SUMINOE Co.,Ltd began production of ECOS recycled carpet tiles made from high ratio of recycled PVC material devepoled with Sumitomo Corporation and Refineverse Inc. and aim to realize the resource recycling.

New Eco Mark certification criteria

The criteria of Eco Mark product category No.123 (Building Products Version 2 C-7 Tile Carpets) newly adopt the concept of "horizontal recycling", requiring the collection system of waste carpet tiles and the use of post-consumer materials derived from waste carpet tiles at a rate of 10 percent or more of the total product mass.

The strong points of ECOS are as follows,

①Recycled material ratio of up to 77 percent , far superior to New Eco Mark Certification Criteria.first product acquired the new certifacation criteria.

②Maximum CO_2 emissions reduction rate of 43% in the LCA assessment of Mizuho Information & Research Institute, Inc.

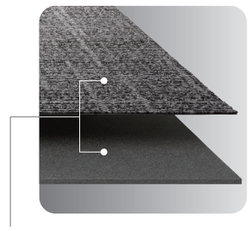
③The same cost performance level as virgin tiles.
Collecting of capet tile wastes ⇒recycling materials ⇒ producing and selling of recycled carpet tiles ⇒Usage ⇒ Collecting … ECOS's concept is "Resources to the future" and makes ECO value chain.

ECOS iD−9000

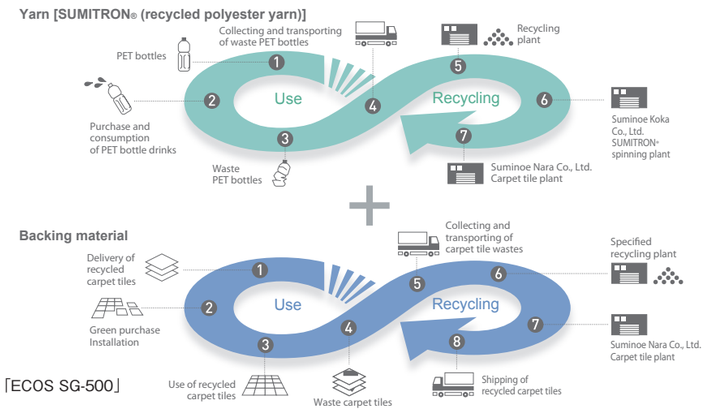
SUMINOE started to produce ECOS series (25 marks, 272 items) from July 15,2011 and will apply ECOS toall of its carpet tiles.

Following the key phrase “Resources for the future,” we intend to play a leading role in helping establish a sustainable society as a pioneer interior maker.

ECOS® ECOS Double Recycle System



Both the surface and backing materials use recycled materials.



ECOS® Recycle System

「ECOS SG-300･300TF」、「ECOS SG-400」、「ECOS SG-500」

Environmental-friendly technology and products

Products acquired Eco Mark

361 items of Carpet, Curtain and e Access-floor "SE-Light N" have acquired Eco Mark.

The Eco Mark program which the Japan Environment Association undertakes, is managed in accordance with the standard and principle (ISO 14020, ISO 14024), a type I environmental-label display.

The Eco Mark is applied to the products with low environmental impacts and useful for environmental conservation through the whole life cycle as "from cradle to grave".

It depends on the product group such as the carpets and curtains about the recognition standard, and the reproduction material mixing rate standard is different respectively.

It is not a throw-away product, "It is displayed that it is easy to recycle", and "Severe standard to the poisonous substance", etc. are provided besides the reproduction material mixing standard.

Suminoe receives recognition in the field of the carpet tile, roll carpet, piece carpet, rug carpet and the curtains, and will increase in the future.

Products line up

- Recycled Carpet Tile「ECOS® 」(272 items)
- Curtain「mode S Vol.6」「face Vol.7」(41 items)
- Roll carpet「CARPET Concierge Vol.3」(12 items)
- OA floor「SE-Light N/NK」(6 items)
- Rug carpet「HOME® 2012-2013」(30 items)

……Total 361 items as end of October 2012.

ECOS iD−3000

Eco-fabric with Eco Mark※

Fabric corresponding to "Green Purchasing"

We offer "Eco-fabric" with Eco Mark using recycled yarn as seat fabrics of railway vehicles or buses.
(Certificated No.03105015)

In recent years, sales quantity is increasing with a rise of the purchase consciousness of eco-friendly products.

※Eco-fabric with Eco Mark : Recycled yarns are used 50% or more.

Eco-fabric: Keihin Kyuko Bus Haneda Airport KEIKYU LIMOUSINE

Designated procurement goods by Law on Promoting Green Purchasing

824 items are registered in curtain and carpet section

Suminoe takes part in "Green Purchasing Network(GPN)", a network among industries, administration and consumers, which was established to promote Green Purchasing. GPN sets up a guideline as "reclaimed polyester 25% or more (weight ratio of the product)" in interior furnishing products as equipment materials and officially announces them as "Designated procurement goods by Law on promoting Green Purchasing". Suminoe has registered 824 items in this "designated products". Suminoe positively promotes Green Purchasing by showing mark on these products.

Products line up

- Recycled Carpet Tile「ECOS® 」(272 items)
- Curtain「mode S Vol.6」「U Life Vol.6」「face Vol.7」(261 items)
- Roll carpet「CARPET Concierge Vol.3」(12 items)
- Hard Floor「SUMITECKi」「SUMIRIUM」etc. (279 items)

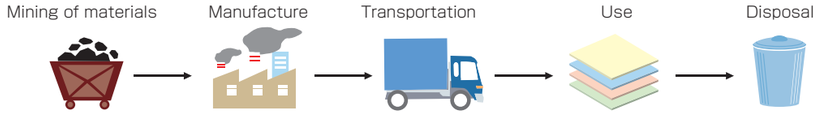
……Total 824 items as end of October 2012.

E-7381(face Vol.7)

Environmentally consciousness of products valued through LCA

LCA is ...

LCA is known as "cradle-to-grave analysis". It is a comprehensive, quantitative assessment on the environmental effect of entire life cycle of the product from its gathering of materials, manufacture, transportation, use, to disposal.

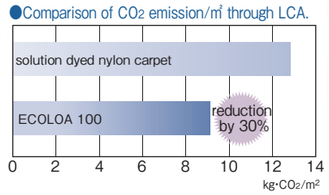


「ECOLOA 100」

ECOLOA 100 reduces 30% CO_2 emission

ECOLOA 100 is the industry's first rolled carpet product which has acquired the Japanese Eco Mark and has reduced CO_2 emission by 30% than solution dyed nylon carpet.

It makes use of Sumitron® (polyester yarn) that contains 60% or more reclaimed materials from recycled PET bottle.

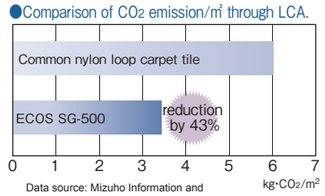


ECR−101/ECR−104

「ECOS SG-500」

Sustainable recycled carpet tile ECOS SG-500 has reduced 43% CO_2 emission.

ECOS SG-500 series are epoch-making carpet tiles containing recycled material both in the surface pile Sumitron® and recycles PVC in the backing, and certified products that meet the criteria of "Eco Mark" by containing 74% of post-consumer material.



Data source: Mizuho Information and Research Institute, Inc

SG−502/SG−504

Car seat fabrics using bio-mass derived fiber.

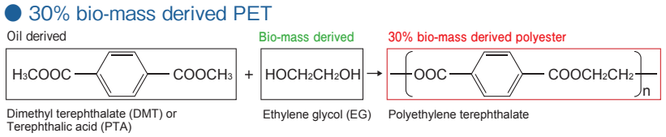
Bio Master

Among concerns about the depletion of oil resources, many car seat fabrics using bio-mass fibers have been proposed. But no bio-mass derived fiber could have been replaced easily with oil derived PET fibers. Suminoe Teijin Techno Co.,Ltd. has developed "Bio-Master", the seat surface material which is using the sugar cane derived fiber which can be replaced immediately with oil derived PET fiber without any concern in the physical properties.

features

1. It has equal potential (yarn structure, performances) as oil derived PET fabrics, and can create design and texture as wanted.
2. It excels to other bio-mass seat fabrics in productivity and cost performance.
3. It can contribute to reducing CO_2 emission and load on environment.

● 30% bio-mass derived PET



bio-mass derived EG→30% bio-mass derived PET

- Production process of Bio Master is same as that of oil derived PET and shows no difference in performances.
- Bio Master can be verified by radiocarbon dating.
- It can acquire "Biomass PlaMark" of Japan BioPlastics Association and "Biomass Mark" of Japan Organics Recycling Association.

Comparison of performances of bio materials

	oil derived PET	Bio Master	Bio PTT	PLLA
melting point	255℃	255℃	230℃	170℃
degree of bio-mass	0%	31%	36%	100% heat & light resistance
concerns	−	−	strength decline	strength decline & light resistance

NISSAN LEAF

Environmental-friendly technology and products

Olefin floorcoverings and constructional materials

With a purpose to reduce a load on environment, we are now developing processing technology for new-generation floorcoverings and constructional materials by adopting olefin resin where PVC is mainly used. We have developed "OH FILM S" which is easy to be installed and has an anti-slippery function to follow olefin tile "OH TILE" and olefin long sheet "OH SHEET S".

They are adopted in railway vehicle area and are expected as future products.

Following features are realized by technology development.

☆Safety	It generates little toxic gas at incineration as the material is olefin.
	It is authorized as flame-retardant in flammability test for railway vehicle materials.
☆Anti-slippery	It is used at the entrance of railway vehicles due to its anti-slippery function.
☆Durability	It has an excellent wear durability.
☆Anti-pollution	It is very hard to be polluted by pollutants as oil or chemicals.
☆Easy installation	It is easy to be installed in a short time as special adhesive is applied on back face.
☆Design	As the mat itself is transparent, various designs are available by printing.

▶Safety fanction

◆Comparison of combustion (ppm)

Item	Polyolefin flooring	PVC flooring
Carbon Monoxide (CO)	123	267
Hydrocyanic acid gas (HCN)	No detection	11
Hydrogen Chloride (HCl)	No detection	100
Hydrogen Fluoride (HF)	No detection	No detection
Sulfur Dioxide (SO2)	No detection	No detection

◆Comparison of smoke generation (Ds)

Polyolefin flooring	PVC flooring
After 4 minutes 62	After 4 minutes 171
Maximum value 122	Maximum value 171

◆Slip resistance Tester

The above chart shows the range of CSR* under various conditions with men's soft sole shoes.

*CSR stands for Coefficient of Slip Resistance, which is a coefficient to evaluate slippery and it evaluates safety against slippery in walking.

OH TILE® Toshiba Elevator

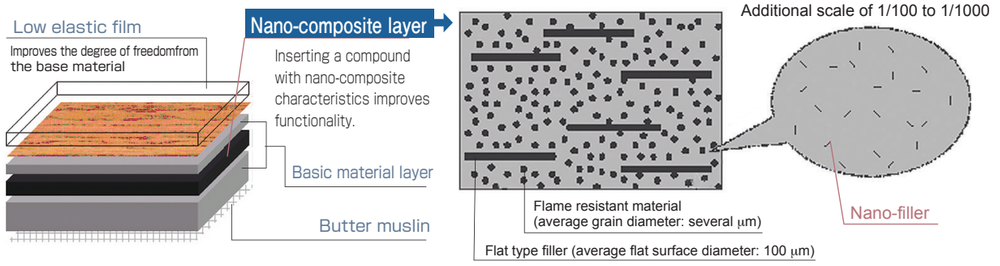
Highly functional flooring with olefin nano-composite technology

▶Highly effective using only a minute amount!!

Ordinarily, when creating a highly flame resistant and abrasion resistant property to olefin resin floor material, either its weight per unit area or rigidity increases, making the floor material itself harder. This may cause dimentional instability caused by heat.

To solve these technological problem, we've developed a technology that creates a compound layer by applying just a small amount of scattered specific nano-size filler.

By integrating this nano-composite layer in floor material, we've created a dramatic effect.



Creating a composite with nano-filler
Add only 1 to 3%,
for dramatic reinforcement!

(1) Kinetic properties:
1.5 times stronger, twice the elongation
(2) Coefficient of thermal expansion:
The same as metal, 3 to 6 X 10^{-5}/K
(3) Flame resistance:
Emergence effect of combustion residuals
(4) Weight savings:
Saves 25% more than vinyl chloride

Polyolefin display film

OH Film S7P (for railway vehicle)

It has been adopted as entrance anti-slip material for railway vehicle required high level of safety.

- Environment : Less poisonous gas HCN,HCl
- Safety : High anti-slip and durability under the wet & dry condition.
- Gentleness : Display by print "NOTICE" "GUIDANCE" "ATTENTION"

OH Film S7P: Mobile phone power off area
Transportation Bureau, City of Yokohama

OH Film B (for Bus)

It has been adopted as a warning film for accident prevention in the bus. Using aluminum base layer, It can be easily glued not only to the flat floor but rough floor.

OH Film B:HANKYU BUS

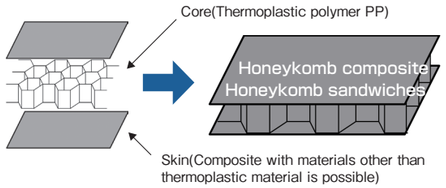
Fire-resistant honeykomb structure "SUMIHONEYCOMB"

The structure which is lightweight and has intensity was developed by kneading a Suminoe's special nano-size fire-resistant filler to the honerkomb structural body of the thermoplastic polymer.

▶Honeycomb structure

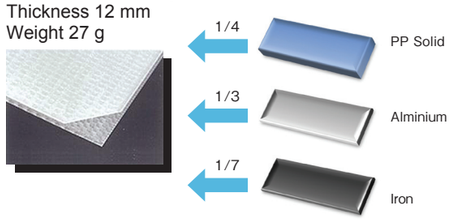
Intensity is not spoiled but required material can be reduced. ⇒Most outstanding structure

Space filling of polyhedral cells



▶Weight saving (Comparison with the same flexural rigidity)

Polypropylene honeycomb
Thickness 12 mm
Weight 27 g



▶Suminoe's technology of flame retardant

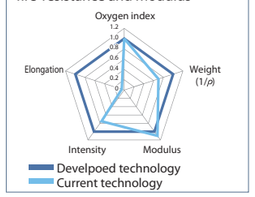
Current technology

A lot of inorganic fire retardant in the PP polymer
⇒Falling of dynamic characteristic or processability

Developed technology

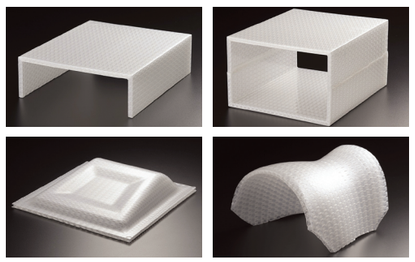
Chemical fire-resistance machanism and formation of the layer which intercept fire.
The small amount of nano-size fire-resistant filler.
⇒Realization of fire-resistant material with safety and high performance.

Performance comparison of compound with the same fire-resistance and modulus

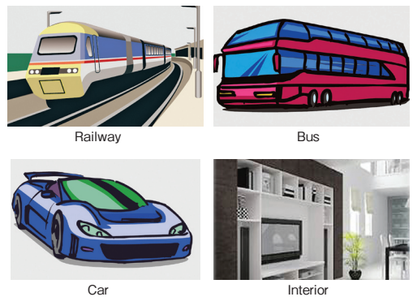


▶Second process of PP honeycomb structure body

3-dimensional processing (Bending, Press, Welding) is possible by the characteristic of thermoplastic.



▶Possibility of deploying applications of "SUMIHONEYCOMB"



Environmental-friendly technology and products

ECOな生活 ECO na seikatsu (ECO Life)curtain

Clear label of the energy-saving effect of the curtain

▶ About 25%※1 of home energy is consumed by air-conditioners.

Openings (Windows) of the housing serve as lighting, sunshine, draft ventilation and viewing. Energy-saving measures are also required for windows all year round to get comfortable indoor environment.

71% of heat inflow from outside come home from windows while cooling in summer daytime. and 48% of heat outflow to outdoor go out from the windows.

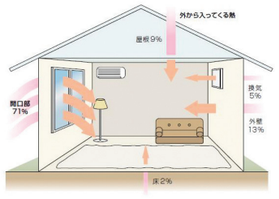
Reduction of these heat flow is main measure of energy-saving. You can save energy cost by switching to thin curtain in summer and block heat inflow from outside and thick curtain in winter and block heat outflow to outside.

LESCOM-Suminoe simulation program can calculate energy-saving performances of Suminoe's all curtains. Please use it as a new standard for selecting curtain.

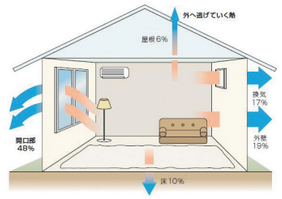
※1 Data source : Agency for Natural Resource and Energy FY2004 summary of electric power supply and demand

Reference
※Heating condition (period and temperature set point)
Energy-saving product catalog 2009 published by The Energy Conservation Center, Japan
※Heating electric power consumption
Calculated by transient heat load calculation program in multiple rooms "LESCOM-Suminoe" Coefficient of Performance COP=2.5
※Electric power cost
22Yen/kWh FY2004 Home Electric Appliances Fair Trade Conference
※CO_2 emission(kg)= electric power consumption(kWh) ×0.373(kg/kWh)

Ratio of heat inflow from windows while cooling in summer daytime is 71%.



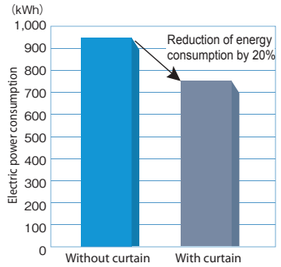
Ratio of heat outflow from the windows while heating in winter is 48%.



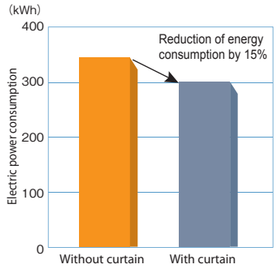
省エネ ▼20% Annual energy cost is **saved by 4,000 yen** and annual CO_2 emission is **reduced by 70 kg.**

省エネ ▼15% Annual energy cost is **saved by 1,100 yen** and annual CO_2 emission is **reduced by 20 kg.**

● Thin curtain with high insulation effect (20% energy-saving curtain)



● Thick curtain with high heat-retaining effect (15% energy saving curtain)



Cooling period : Jun.2 ～Sept.21 (112 days)
Cooling setting temperature : 27℃ (operation time 6:00-24:00)
Open and close time of the curtain : close all day

Heating period : Oct.28 ～Apr.14 (169 days)
Healing setting temperature : 20℃(operation time 6:00-24:00)
Open and close time of the curtain : open from 7:00 to 17:00

Curtain can save heating and cooling energy loss and monthly utilities. Suminoe indicate 4 class of energy-saving performance for all curtain. Please use as a new standard for selecting curtain.

数字が大きいほど省エネ効果が高く、冷暖房の効果を４段階で表示しています。

●Heating effect for thick curtain , Bigger value means higher energy-saving
省エネ ▼15% 省エネ ▼10% 省エネ ▼5% 省エネ ▼4%以下 or less

●Cooling effect for thin curtain , Bigger value means higher energy-saving.
省エネ ▼20% 省エネ ▼15% 省エネ ▼10% 省エネ ▼9%以下 or less

▲ D-8544 : Sample curtain of cooling energy saving 15% and heating energy saving 5%

省エネ ▼15% 省エネ ▼5%

Products line up

・Curtain「mode S Vol.6」「U Life Vol.6」「face Vol.7」

Antibacterial and antimold SUMITRON® AM yarn

Antibacterial, bacteriostatic, odor-resistant, antimold functions areadded to SUMITRON® yarn used as carpet pile yarn.

It has an effect which suppress dermatophyte at the time of water use. It has a bacteriostatic function in medical spot and it can maintain clean environment.

SUMITRON® AM has aquired SEK (Green, Red, Orange, Blue) Mark of JTETC(Japan Textile Evaluation Technology Council).23-3

Bath Mat

Anti-allergen fiber processing technology

Aller-Block® Wallpaper, Curtain, Carpet

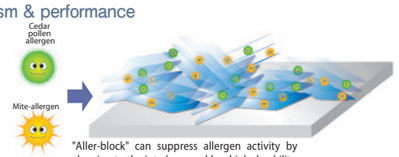
"Aller-block" was developed to give a new function of anti-allergen to wallpaper.

"Aller-block" can suppress allergen activity by absoring to the multilayer structure made from inorganic materials form natural mineral and has high durability even after high temperature treatment.

Products line up

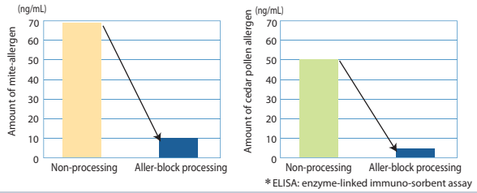
・Rug「SUMITRON® GLAIN」「SUMITRON® HARMONY」「NEOGLASS」「SUMITRON® DUO」「LAX FUR」「GLASS WEB」「SHARON」、
・Wall paper「Anti-allergen wallpaper Aller-Block®」
・Curtain「U Life Vol.6」「face Vol.7」

● Mechanism & performance



"Aller-block" can suppress allergen activity by absoring to the interlayer and has high durability even after high temperature treatment.

● Assessment by ELISA*



* ELISA: enzyme-linked immuno-sorbent assay

R6009(Anti-allergen wallpaper Aller-Block®)

Antiviral function fiber processing technology

Effective against the virus! ※1 Protect your family from virus by curtain and carpet. ※2

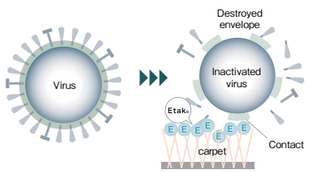
CLEANSE クレンゼ

Joint study of KURABO and SUMINOE applied CLEANSE® to curtain and carpet.

Antiviral function fiber processing technology「CLEANSE®」is the effect on virus have been confirmed.「Etak®」developed by Hiroshima University immobilized antimicrobial component based that is used for cleaning of oral cavity. CLEANSE® is the processing technology that strongly immobilized on the surface of the fiber.

Immediate effect

Unaffected by environment and weather. Reduce the risk of spreading of virus with envelope after CLEANSE® finishing.

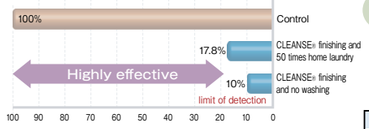


(Image)

Durability

Maintain a high level of durability and sustainability while maintain the texture of the material. Virus titer is more than 90% in virucidal activity test.

■Virucidal activity / Virus titer
Testing laboratory : Hiroshima Unuversity Graduate school of Biomedical and Health Sciences. Department of Virology

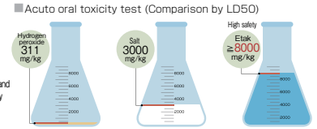


(Test data by using 100% cotton fabric)

Safety

High safety made from anti-microbial dental cleanser. Extremely high level of safety has been demonstrated by Mutagenicity, Acute oral toxicity and Skin irritation test.

■Acuto oral toxicity test (Comparison by LD50)



Mutagenicity test	Mutagenicity	Negative
Acute oral toxicity test with female mice	LD_{50} ≧8000mg/kg	No abnormality was observed in the mice.
LD50/ Leathal dose that causes the death of half of the test animals in a given amount of time. The higher the number, the administration of a low hazard.		
Skin Primary irritation test with rabbits	Etak® agent	nonstimulative
	Etak® treated towel	nonstimulative

About Etak®

Etak® is immobilized antimicrobial component developed by Professor Hiroki Nikawa (Chair of Oral Health Science, Department of Oral Health Engineering, Graduate school of Biomedical Science, Hiroshima University). Its main component is antimicrobial ingredient based that is used for cleaning of oral cavity.

※1 "Effective against the virus" means to reduce function of virus in contact with the fibers. It does not work on all virus.
※2 Antiviral fiber processing technology「CLEANSE®」can reduce the risk of spreading of virus with envelope touching the surface of curtain and carpet. It does not guarantee the prevention of infection in real space.

Products line up

・Rug「GLASS WEB」「SHARON」、Pieace carpet「Piece Vol.1」
・Curtain「U Life Vol.6」「face Vol.7」
・Recycled carpet tile「ECOS iD-4000」「ECOS iD-4100」

Environmental-friendly technology and products

Deodorizing treatment technology「Triple-Fresh® series」

Triple-Fresh®・Triple-Fresh®Ⅱtreatment technology

Triple-Fresh® series, which absorbs and decomposes formaldehyde, cigarette smell and four major household odors, has been evolved.

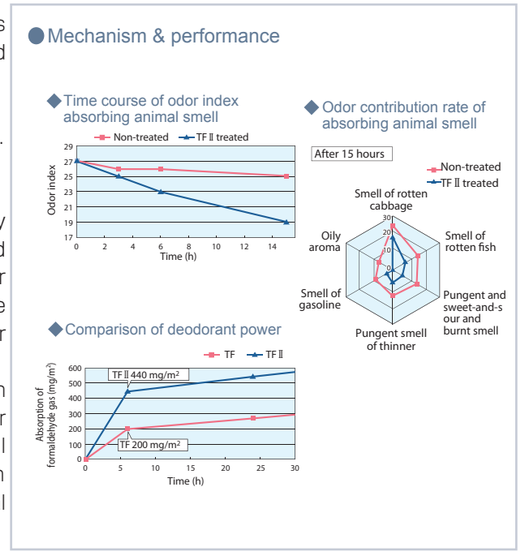
Triple-Fresh®Ⅱ treatment

①Ability to absorb and decomposes pet odor is added.

②Ability to kill formaldehyde has become two times stronger than Triple-Fresh® treatment.

It not only absorbs odors simply, but chemically decomposes into harmless ingredients as water and carbon dioxide using oxygen in the air (24 hour cycle odor-killing system). As a result, it will release odors very little. In this way, we can offer interior decoration products with excellent function.

Triple-Fresh®・Triple-Fresh®Ⅱ treatment are used in carpets, curtain fabrics, wallcoverings, automobile interior fabrics, etc. In 2012, it is adopted to the three types wall protection materials in the elevator (carpet, nonwoven and film) and expected to contribute to the environmental improvement of the collective housing shared zone.



「Triple-Fresh®Ⅱtreatment」curtain, carpet, wallpaper, etc.

Triple-Fresh®Ⅱ treatment is a reliable and safe 24-hour cycle odor destroying treatment not only absorb but decompose unpleasant odors into harmless ingredients as water and carbon dioxide by using oxygen in air.

Products line up

- ・Curtain
  「mode S Vol.6」「U Life Vol.6」「face Vol.7」
- ・Carpet「Recycled carpet tile ECOS® SG-300TF」
  Rug 「HOME®」「Big Size Rug Vol.6」
- ・Wallpaper「Air Cleaning Wallcovering」
- ・Wall protection materials in the elevator

R−4613(Runon Home1000)

Wall protection materials in the elevator (Carpet type : FUJITEC)

「Triple-Fresh® treatment」headliner, seat fabric, curtain, etc.

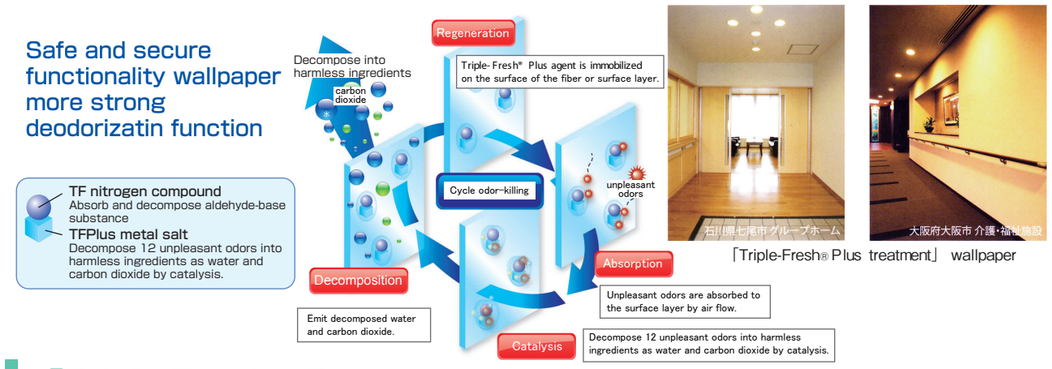
Bad odor from pets or cigarette in a car or railway vehicle is absorbed and decomposed by applying Triple-Fresh® treatment on headliner or seat fabrics. You will hardly notice unpleasant odors on the next day.

Deodorizing headliner : MAZDA PREMACY

Deodorizing curtain・moquette : Kintetsu Railway "Ise-Shima Liner"

「Triple-Fresh® Plus treatment」 wallpaper

Safe and secure functionality wallpaper more strong deodorizatin function



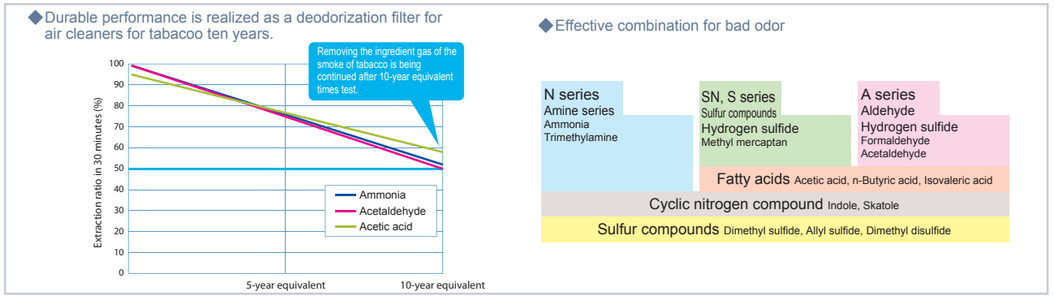
「Triple-Fresh® Plus treatment」 wallpaper

「Triple-Fresh® Bio treatment」

Triple-Fresh® Bio" is developed on new concept processing technology to make artificial enzyme supported on a special corrugate. It quickly attracts bad odors by an absorbing function with quick effect and decomposes bad odor (sulfar odor) continuously with the aid of catalysis of artificial enzyme. It can maintain quickly effect and long durability and not require energy, then it can be used deodorizing filter mainly for home apliance products as refrigerator for 9 years.

The removal period of the bad smell of aldehyde is much more longer by the improvement of filter base material and chemical absorption agent.

Application to air conditioner was attained by the fire-resistant performance.



Air freshener (Tispa series -Tune to Infinite SPecial Air)

Air freshener "Tispa (Tune to Infinite SPecial Air)" is a series of consumer products which mitigate unpleasant odors in home by Triple-Fresh® Bio treatment.

Tispa had 3 types for refrigerators, lavatories and shoe cabinets. And we have launched new 4 types for bags, shoes, cloth closet and trash bucket.

Tispa series

Air-filter product group

Triple-Fresh® Bio" is new concept of deodorizing filter that biomimetic enzyme is invested in corrugate carrier. It continuously deodorizes unpleasant odor gas in the refrigerators, air cleaner, toilet seat. Biomimetic enzyme works as catalyst, and decomposes and deodorizes unpleasant odor by oxidation-reduction reaction.

Therefore it's validity is semi-permanent.

Deodorizing air filter for air cleaner

Environmental-friendly technology and products

Indoor environment improvement technology

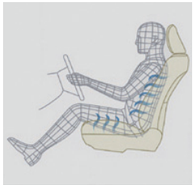
Driver's ventilation seat

Suminoe's special seat fabric is adopted for the driver's ventilation seat. Freshing air flow is blown by a fan from the seat surface and the backrest to reduce the heat of summer.

To achieve the driver's ventilation seat in a compact car, the seat fabric itself has a sufficient air permeability, more specifically

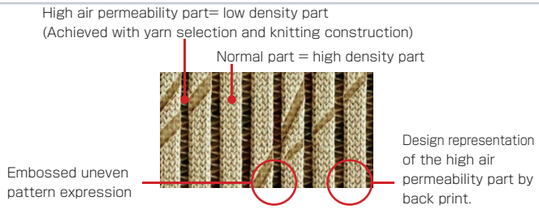
1.Air permeability > 150ml/cm²/sec
2.Design representation
3.Combine high durable strength and high permeability are necessary.

Our special seat fabric has a air permeability (180ml/cm²/sec=80% higher than the conventional) and cooldown performance was enhanced significantly.



Air flow image of the driver's seat with ventilation function

This fabric ventilation seat was developed in collaboration with TOYOTA BOSHOKU CORPORATION, received the COROLLA Project Technology Award from TOYOTA MOTOR CORPORATION.



TOYOTA COROLLA AXIO

Cooling technology (cool eco treatment)

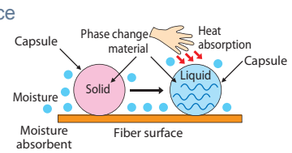
We have developed cooling technology as a value-added function to carpets for spring and summer seasons.

So far there are only carpets which make you feel fresh with its material or structure. But this product is after treated with special micro capsules, it quickly absorbs body heat and makes you feel cool and fresh when touched.

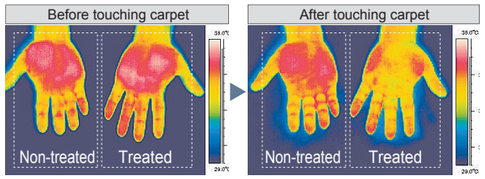
Two levels of cooling agents are used in this treatment, you can feel coolness in the range of 20℃ to 28℃, with which we can expect reduction of cooler expense or reduction of energy.

● Mechanism & performance

Since body temperature is absorbed when the substance enclosed in the microcapsule melt by body temperature, it is felt cool.



◆ Surface temperature measured by thermograph



Warming technology (warm eco treatment)

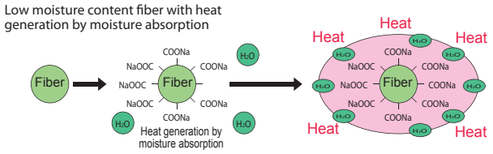
We have developed warming technology as a value-added function to carpets for autumn and winter seasons.

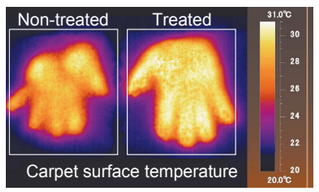
When a body touches a carpet in dry winter, the carpet absorbs moisture evaporating from a body and treated materials themselves generate heat.

This treatment can be applied to materials like polyester which never absorbs moisture. You can feel comfortable warmth and reduction of energy is expected. As summer is high humid environment, textile already absorbs moisture, it never generates heat.

● Mechanism & performance

Low moisture content fiber with heat generation by moisture absorption





Lightweight

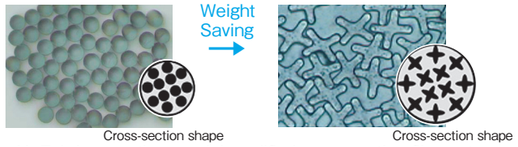
Air Fabric

▶ A unique modified cross-section fiber contributes to weight saving of the surface material of car seat.

By using the special modified cross-section fiber which is light and bulky, we have realized the 30% of weight saving of seat surface material to improve the fuel efficiency.

Merit

The bulkiness of the highly modified cross-section fiber makes the apparent thickness wider, and it makes the weight per unit less, saves the weight of whole product.



Air Fabric uses the special modified cross-section filament of cross-shaped.
The 30% weight saving is possible when using 100% of cross-shaped filament by reducing the apparent specific gravity.

Back Coat Less Fabric

▶ Fabric with jacquard design which

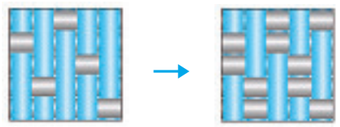
By eliminating backing resin, the fabric becomes lighter and inexpensive. It can cut out load on environment attached to backing resin.

Merit

1.By eliminating back resin, the fabric becomes lighter and inexpensive.
2.It can cut out load on environment attached to backing resin.
3.It improves drape performance.

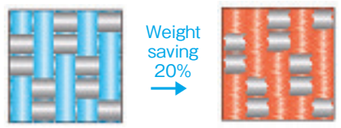
Back Coat Less Fabric: SUZUKI SWIFT

Concept of structure
By using structure where fray is hard to occur, it needs no backing.



Current structure → Structure which prevents fraying

Concept of material
Material which has shifting prevention effect is used at the joint of warp and weft.



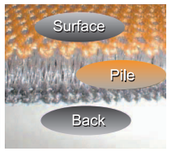
Current yarn → Shifting prevention yarn

Swing-Net® Fabric (3 dimentional knit fabric)

Applying current warp knitting technology, we have developed the most suitable materials and knit construction with an aim to create products which provides cushion capacity.

As mono-filament yarn(gut) is used as a yarn which connects knit construction of both surfaces, fabric itself is able to have cushon capacity. So this is a resource-saving product which does not require cushion material when used as upholstery.

Besides cushion material, this is widely used as a car seat material, functional bed, desk partition featuring its comfortness or light weight.



Car seat(Swing Net Fabric) Structure of cross section

Environmental-friendly technology and products

Lamination processing technology (making various sheet film by exrusion molding with wide T-die)

Rubble covering sheet

Covering sheet for temporaly rubble occurred in the natural disaster. It suppress spontaneous combution and has flame resistance, waterproof and deodorant. It has been adopted to put temporary rubble of the Great East Japan Earthquake.

Rubble covering sheet

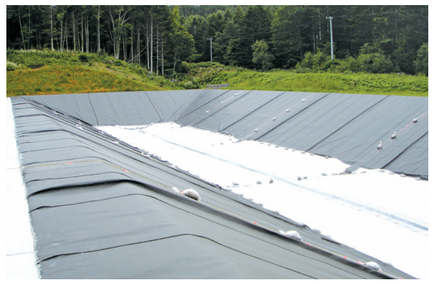
Special water shield system at disposal site

Total water shield system Barias

Sheet used in the slope and base of waste disposal site is provided with the role to prevent water from the waste penetrating into soil.

Special-treated water shield sheet" Barias" bears this important role in our total water shield system.

As polyester non-woven fabric made from PET bottles is used in the protective sheet, this system is "Eco products" which positively tackles with protection of environment.



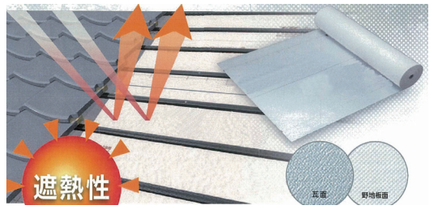
Protective sheet at disposal site (Kiyosato,Hokkaido)

Breathable heat shield roofing sheet

Breathable heat shield roofing sheet under roof tile

Asphalt roofing sheet is commonly used for waterproof of roof, but Suminoe produces new type of roofing sheet. It is lighter weight than asphalt roofing and reflect radiant heat from roof tiles warmed by sunlight.

It can control indoor temperature rise and save the air control energy. Moreover the house durability is made stronger by breathable water-proof function.



Breathable heat shield roofing sheet under roof tile

Waterproof weatherstrap sheet

Waterproof weatherstrap sheet for residential aluminum sash and cap piece at veranda.

Waterproof layer (surface)

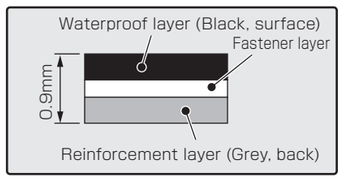
Special waterproof and elastic polymer layer can stop rain invasion and seal the tacker staple hole.

Fastener layer

Functional nonwoven spunbond can fasten tacker staple or screw tight and improve the water resistance of waterproof layer.

Reinforcement layer

Strong nonwoven spunbond can reinforce the entire sheet.



Other technology

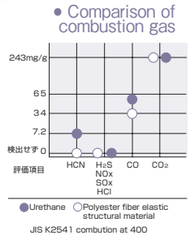
Seat cushion material for railway vehicles

SUMICUBE®

This is the seat cushion material for railway vehicles which are treated special processing of the polyester fiber elastic structural material. Recycling is possible after being used as a sheet for a long time. Our company has established the recycling system which collects used materials and is reused.

Moreover, as compared with the urethane currently generally used as cushion material of a seat, it generates less poisonous gas like cyanogen gas at the fire outbreak, it is a safe material.

It is adopted as JR SANYO KYUSHU SHINKANSEN "MIZUHO" and "SAKURA" as cushion material of a back reclining portion.



SUMICUBE®: JR SANYO KYUSHU SHINKANSEN "MIZUHO"and "SAKURA"

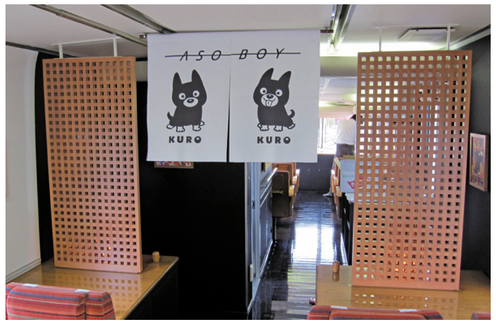
Ink-jet printing system

True art system ·Nassenger

"True art" is digital print system using special pigment ink that applies for wall coverings and floor coverings.

"Nassenger" is ink-jet dyeing system that prints digital design on fabric. These systems can produce energy-saving and resource-saving goods that reduce waste water during printing process. And they can produce various products with small lot and full color.

We, Suminoe, apply these systems to apparel, interior goods, seat fabric of various vehicles.



JR KUSHU EXPRESS ASOBOY
(Supervised by DON DESIGN ASSOCIATES)

Next generation net for the screen door

「CLOTH CABIN®」

CLOTH CABIN® is a fine mesh net to prevent an invasion of the pollen and dust. High density weaving of polyester monofilaments can realize this mesh size 80μm (1/160 smaller than conventional products).

The design to set up outside of conventional products prevent an invasion of the pollen more than 80%.

The raindrop becomes hard to invade it,too.

In a llittle rainfall you can open the windows.

Air flow rate is about 50 to 30% of conventional products (wind block effect) and you can secure the moderate ventilation on the day when the wind is strong.

It can cut 60% of ultraviolet rays because of ultraviolet rays absorption processing.

It is effective in shutting out the view from outside like a lace curtain and can keep your privacy.

CLOTH CABIN®