

## 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.

## Message from the President



### Aiming to be a Company that Coexists with the Environment

In today's sluggish global economy, governments and corporations in every country are aiming at economic recovery and economic growth while they continue their efforts towards the year 2050 target reduction in greenhouse gas emissions that was adopted at the Lake Toya Summit.

Though the United Nations declared 2010 to be the International Year of Biodiversity, it has been marred by the oil spill in the Gulf of Mexico, where a large amount of crude oil began to leak from an offshore oilfield and led to major damage to the ecosystem. This should deeply impress upon us the fact that corporate economic activity can cause severe damage to the natural world and, as a result, also influence human society.

On December 1, 2009, in a joint venture with Teijin Fibers Ltd., Suminoe Textile established Suminoe Teijin Techno Co. Ltd. In line with that, Teijin Teclath Ltd. and Owari Seisen Co., Ltd., which manufacture and process automobile seat covers, have become subsidiaries of that company and thus joined the Suminoe Group. As we advance the structural reform of our business to integrate manufacture and sales, the control of CO<sub>2</sub> emissions will be expanded not only in the Manufacturing Division but also, one by one, to sales subsidiaries such as Suminoe Co., Ltd. and Runon Co., Ltd.

A 3-year plan focusing on the acceleration of overseas development has also been implemented as part of "Challenge 2012", the medium-term management plan that was initiated in June of 2010. We are aiming at business development that considers its effect on the ecosystem not only domestically but also abroad, and our approach for a reduction in CO<sub>2</sub> emissions will be strengthened in the future as well.

Centered on our company's basic philosophy "KKR+A" (K for "kenko" [health], K for "kankyo" [environment], R for recycling, and A for amenity) and the 7 points of the "Suminoe Textile Group Environmental Action Declaration", all companies in the Suminoe Group, both domestic and international, are currently involved in the creation of better, more affluent living spaces and the protection of the global environment.

We hope you will take the time to read this report and we look forward to your candid opinions and comments.

January 2011

Ichizo Yoshikawa  
President,  
Suminoe Textile Co., Ltd.

A handwritten signature in black ink that reads "Ichizo Yoshikawa". The signature is written in a cursive, flowing style.

# Environment-friendly technology

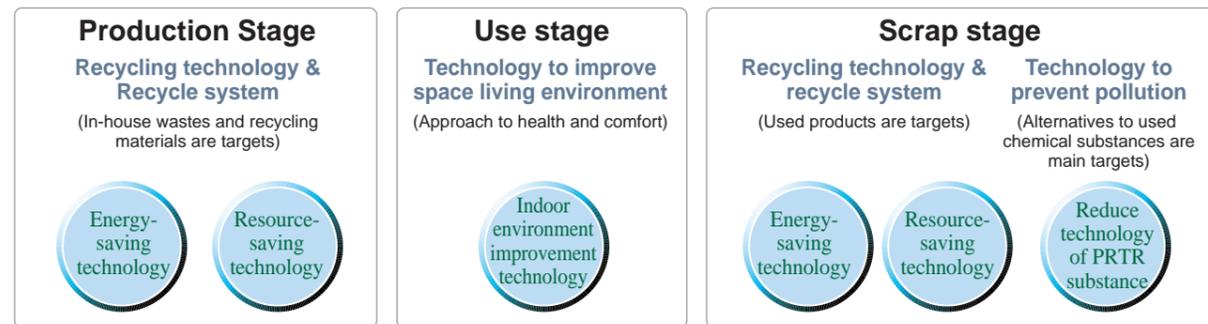
## Efforts for developing technologies

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. But furthermore, our company has been participating in "Collaborative Innovation Center for Nanotech FIBER" of Shinshu University to create a further health revolution and the innovation in the energy reformation field in the future since fiscal year 2007, and also participating in FY2010 Project to support enhancement of strategic fundamental technology of Ministry of Economy, Trade and Industry (METI).

### Environmental technologies which Suminoe Group is approaching



## Collaboration of academia, industry and government for product development

### Joint study with Shinshu University

Fusion of submicron technology, design technology of functional material, and master technique  
 Collaborative Innovation Center for Nanotech FIBER is the studying center that combines the ultrafine processing technologies and the designing technologies on functional materials that Shinshu University has developed on the way to pursue the high performance fiber engineering with the *takumi* (master)'s expertise that the collaborate industries have kept.  
 It aims to achieve the health and energy-revolution made by nanotech fiber, and to make healthy and sustainable society real.



Dramatic expression by true nano technologies  
 Fusing structure and function

### Breakthrough

Nano-sized fiber, control of nano-level surface and internal structure, nano-level defect control, and biomimetics

### Awaiting solutions for:

Global environment and living environmental problem  
 Resource depletion and energy issue  
 Aging society and health

### Target

Realization of healthy and sustainable society by nanotech fiber

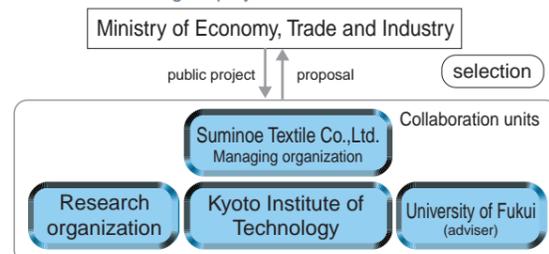
### One example of the joint study



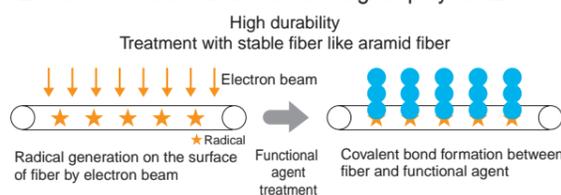
### Ministry of Economy, Trade and Industry

FY2010 project to support enhancement of strategic fundamental technology  
 The Small and Medium Enterprise Agency called for R&D project proposals for its program to support the enhancement of strategic fundamental technologies, with the aim of promoting the effective enforcement of the Law Concerning the Enhancement of Technologies Fundamental to SME Creativity. After the screening of submitted proposals, the projects to be implemented were selected.

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



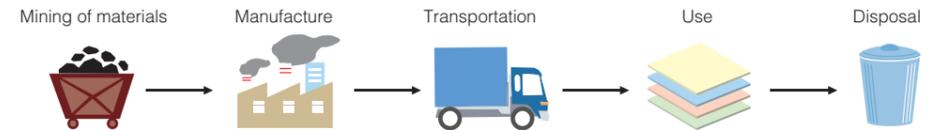
### Electron beam irradiation induced graft polymerization



## Environmental 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.



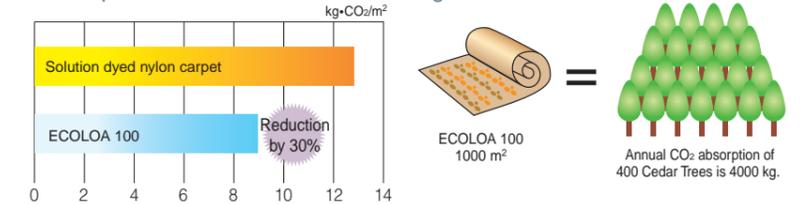
### LCA evaluation of ECOLOA 100 and SUMI-GREEN SG-400/300

#### ECOLOA 100

ECOLOA 100 reduces 30% CO<sub>2</sub> emission

ECOLOA 100 is the industry's first rolled carpet product which has acquired the Japanese Eco Mark and has reduced CO<sub>2</sub> emission by 30% than solution dyed nylon carpet. It makes use of Sumitron<sup>®</sup>, polyester yarn that contains 50% or more reclaimed materials from PET bottles.

#### Comparison of CO<sub>2</sub> emission/m<sup>2</sup> through LCA.

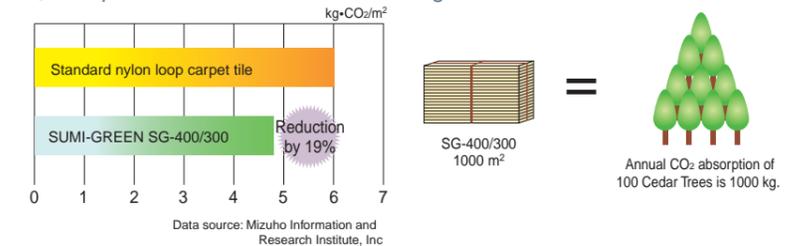


#### SUMI-GREEN SG-400/300

SUMI-GREEN SG-400/300 reduce 19% CO<sub>2</sub> emission

SUMI-GREEN SG-400/300 are epoch-making carpet tiles containing recycled material both in the surface pile and in the backing.  
 SG-400/300 are certified products that meet the criteria of "Eco-Mark" by containing 25% of post-consumer material.

#### Comparison of CO<sub>2</sub> emission/m<sup>2</sup> through LCA.



### Bio Master

#### Car seat fabrics using bio-mass derived fiber.

Among concerns about the depletion of oil resources, many car seat fabrics using bio-mass fibers have been proposed. But there are no bio-mass derived fiber easily replaced with oil derived PET fiber. SUMINOE TEIJIN TECHNO Co., Ltd. has developed sugar cane derived bio-mass PET fiber which has no performance concern and can be replaced with oil derived PET fiber.

#### Features

- It has equal potential (yarn structure, performances) as oil derived PET fabrics and can create feeling and design as wished.
- It excels in productivity and cost performance to other bio-mass seat fabrics.
- It can contribute reducing CO<sub>2</sub> emission and load on environment.

#### 30% bio-mass derived polyester



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.

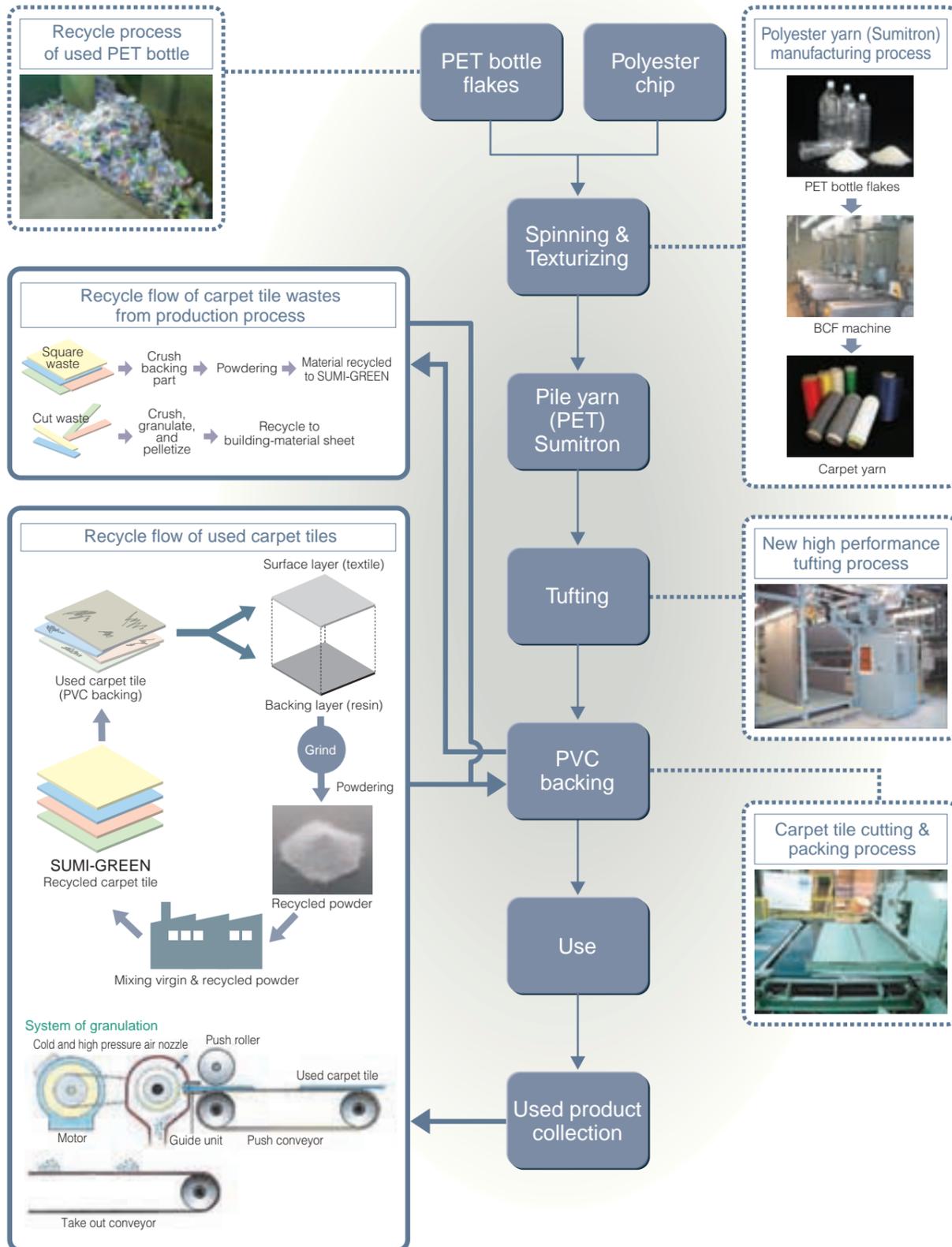


#### Comparison of performances of bio materials

	Oil derived PET	Bio Master	Bio PTT	PLLA
Melting point	255°C	255°C	230°C	170°C
Degree of bio-mass	0%	31%	36%	100%
Concerns	—	—	Strength decline	Heat & light resistance

# Environment-friendly technology

## Recycle process of SUMI-GREEN SG-400-300



## Production Stage Recycling technology & recycling system

### Development of splitting machine and application to recycling technology

#### Application to needle punched non-woven fabric wastes

We have developed a splitting machine to recycle wastes coming from production process of needle punched non-woven fabrics used for automobile floor carpet, trunkroom or headlining. (Patent pending)

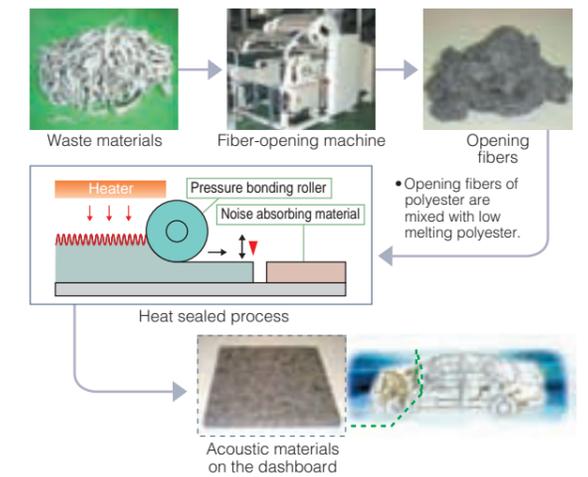
Polyester splitted fibers coming from splitting machine are mixed with low melting point polyester fiber and are made felt by heat welding.

This felt is used as sound insulator in dashboard of automobile and features low load on environment at manufacturing process.

#### Application to seat cushion wastes

Wastes coming from production process of polyester hard fiber used as seat cushions for railway carriages are also re-sourced by this splitting machine.

#### Recycle flow of needle punched non-wovens



### Recycling system at carpet production

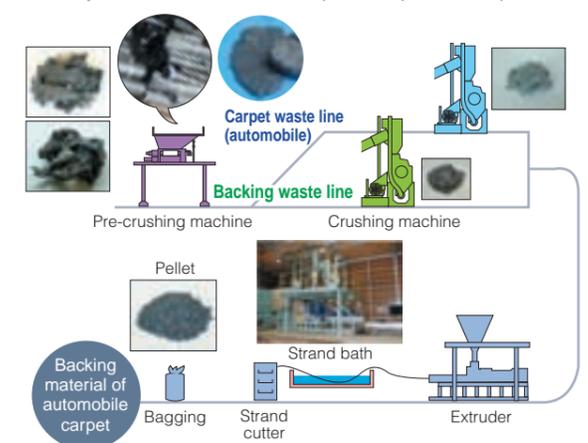
As one of measures to become a low environmental load factory, we have established a system to recycle wastes coming from production line of (1) automotive carpet and (2) carpet tiles as pre-consumer goods.

(1) Wastes coming from automotive carpet production process are pellettized via shattering and extruding processes and reused as backing materials for automotive carpets.

(2) Wastes coming from carpet tile production process are separated as square wastes and cutting wastes and recycled as SUMI-GREEN carpet tile or construction sheet.

These wastes account for 70% of total wastes (in weight) and contributed as a driver to achieve zero emission target.

#### Recycle flow of automobile carpet from production process



### Recycle system to dry and reduce weight of sludge

Sludges which are purified and disposed from water waste are re-sourced as materials for organic fertilizer after vacuum dried and powdered. Sludge accounts very high ratio in industrial wastes in Japan and its disposal mainly depends on landfill which is a big social problem. We dry and dispose of all sludges coming from Osaka and Nara factories with its sludge vacuum dryer. Products by this disposal are used as materials for organic fertilizer or fuels for furnaces at ironworks.

#### Recycle flow of sludge



# Environment-friendly technology

## Use stage Indoor environment improvement

### Deodorizing treatment technology

#### ▶ Triple-Fresh II

Triple fresh treatment, which absorbs and decomposes formaldehyde, cigarette smell and four major household odors, has been evolved.

- (1) Ability to absorb and decomposes pet odors is added.
- (2) Ability to kill formaldehyde has become two times stronger.

It not only absorbs odors simply, but chemically decomposes into harmless ingredients as water and CO<sub>2</sub> using oxygen in the air (24 h 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.

It is used in carpets, curtain fabrics, wallcoverings, automobile interior fabrics, etc.



Fragrance & flavor analyzer

#### ▶ Triple-Fresh Bio

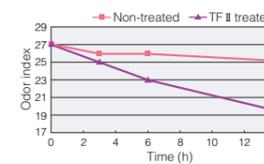
Triple-Fresh Bio is developed based on new concept processing technology to make artificial enzyme support on a special corrugate.

It quickly attracts bad odors by an absorbing function with a quick effect and decomposes bad odor continuously with the aid of catalysis of artificial enzyme. It can be used in home appliance products as refrigerator, air-conditioner or kitchen garbage processing machine, etc.

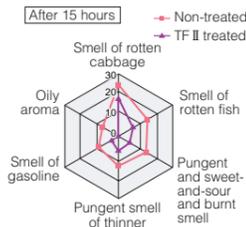
This technology is actually used as a deodorant filter for refrigerators and is upgraded to a new version to eliminate odor from fish and vegetables with one filter.

#### ● Mechanism & performance

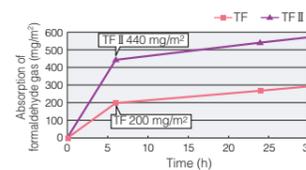
◆ Time course of odor index absorbing animal smell



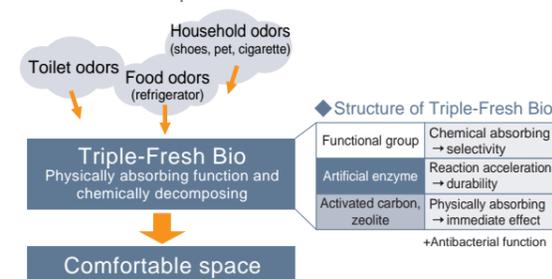
◆ Odor contribution rate of absorbing animal smell



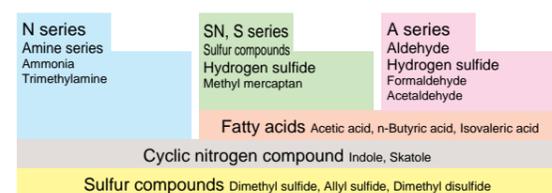
◆ Comparison of deodorant power



#### ● Mechanism & performance



◆ Effective combination for bad odor

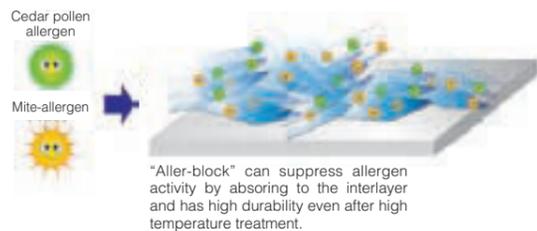


### Anti-allergen processing technology

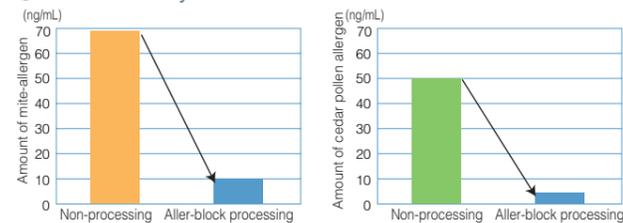
#### ▶ Aller-block

"Aller-block" was developed to give a new function of anti-allergen to wall paper. "Allergen" means the allergy-causing substances such as pollens, droppings or dead bodies of mites.

#### ● Mechanism & performance



#### ● Assessment by ELISA\*



\* ELISA: enzyme-linked immuno-sorbent assay

## Use stage Indoor environment improvement

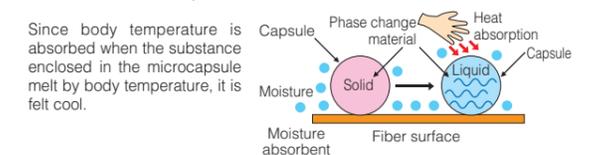
### Cooling technology (cool eco treatment)

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

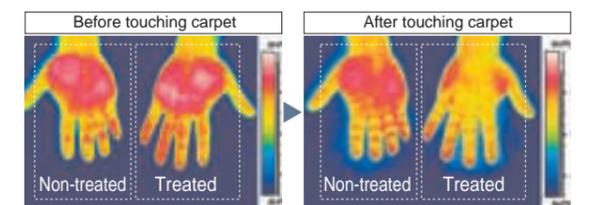
So far there are only carpets which make you feel fresh with its material or structure. But this product is after treated with special micro capsules, it quickly absorbs body heat and makes you feel cool and fresh when touched.

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

#### ● Mechanism & performance



◆ Surface temperature measured by thermograph



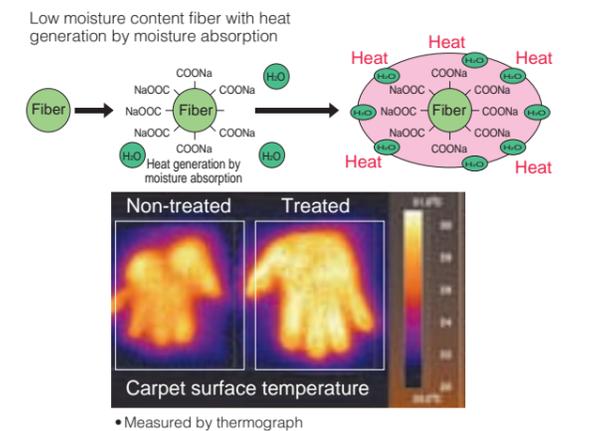
### Warming technology (warm eco treatment)

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



• Measured by thermograph

### Skin care processing technology

#### "Ato-Guard"

It is a technology to process textile by mixing "chitosan"—an ingredient with anti-bacteria and deodorant property and "collagen"—an ingredient with moisturizing property.

It clears the standard of anti-bacteria and safety of Japan Textile Evaluation Technology Council and has acquired SEK mark as a seat covering material.

#### "Amino Clean"

We have also developed a technology to process textile by compounding "Amino-fine"—skin care process using egg shell membrane and "Kohkin Master"—anti-bacteria and anti-mold process.

#### ● Mechanism & performance

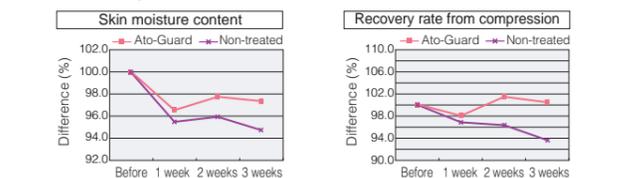
The characters of Ato-Guard

SEK approval number 31T96  
SEK standard  
○ Test for antibacterial activity: bacteriostatic activity value  $\geq 2.2$  after 5 times washing  
○ Test for safety:

	Safety of agents used	SEK standard
Acute Oral Toxicity (LD50) <1>	$\geq 2000$ mg/kg	$\geq 1000$ mg/kg
Mutagenicity test (Ames test) <1>	Negative	Negative
Skin irritation test <1>	Negative	Negative (PI* < 2.00)
Skin sensitization test <1>	Negative	Negative (no sensitization)
Human patch tests <2>	No reaction	Less than 2B
Open patch test		No reaction
Closed patch test		

\* PI (Primary Irritation Index)

#### ● Ato-Guard patch test



# Environment-friendly technology

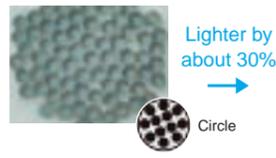
## Use stage Lightweight and pollution control

### Air Fabric

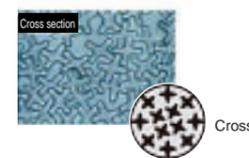
► We pursue "Lightness and comfort performance" through unique yarn cross section which utilizes high yarn production technology.

By employing a yarn with modified cross section, the yarn becomes thick and bulky so that its appearance and weight are improved. Therefore fabric using this yarn becomes lighter.

**Regular round section yarn**  
General cross section yarn



Lighter by about 30%



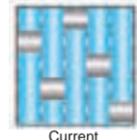
### Backcoatless Fabric

► New fabric with jacquard design which needs no backing

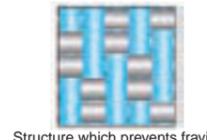
- By eliminating back resin, the fabric becomes lighter and inexpensive.
- It can cut out load on environment attached to backing resin.
- It improves drape performance.

**Concept of structure**

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



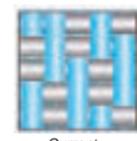
Current



Structure which prevents fraying

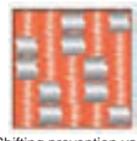
**Concept of material**

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



Current

Light effect  
Approx. 80 g/m<sup>2</sup>



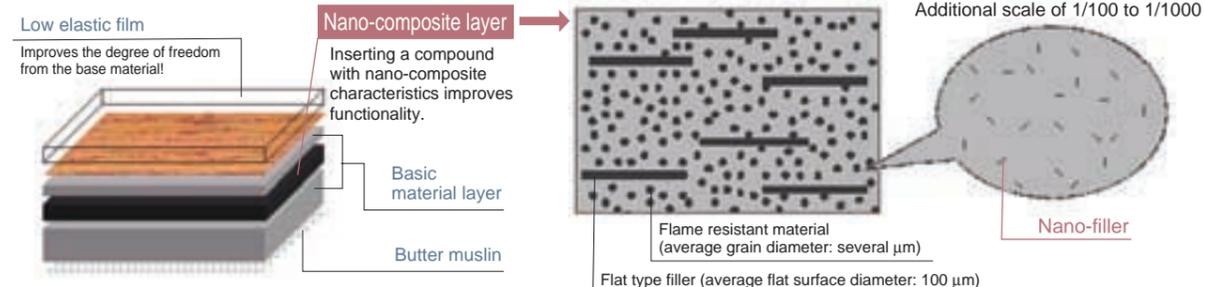
Shifting prevention yarn

### 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 dimensional instability caused by heat. To solve these technological problems, 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<sup>-5</sup>/K
- (3) Flame resistance:  
Emergence effect of combustion residuals
- (4) Weight savings:  
Saves 25% more than vinyl chloride

## Use stage Energy saving

plus **ECOLOGY** 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 flows is main measure of energy-saving. You can save energy cost by switching to thin curtain in summer to block heat inflow from outside and thick curtain in winter to 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

#### References

- 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  
22 yen/kWh FY2004 Home Electric Appliances Fair Trade Conference
- CO<sub>2</sub> emission (kg) = electric power consumption (kWh) × 0.373 (kg/kWh)

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

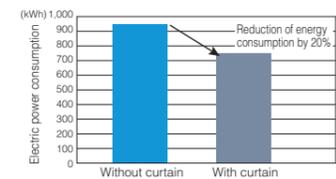


Ratio of heat outflow from the windows while heating in winter is 48%.



Energy cost is saved by 4,000 yen and CO<sub>2</sub> emission is reduced by 70 kg.

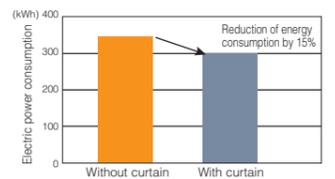
◆ Thin curtain with high energy-saving effect



Cooling period: Jun 2 – Sept 21 (112 days)  
Cooling setting temperature: 27°C  
(operation time 6:00–24:00)  
Open and close time of the curtain: close all day

Energy cost is saved by 1,100 yen and CO<sub>2</sub> emission is reduced by 20 kg.

◆ Thick curtain with high energy-saving effect



Heating period: Oct 28 – Apr 14 (169 days)  
Heating setting temperature: 20°C  
(operation time 6:00–24:00)  
Open and close time of the curtain: open from 7:00 to 17:00

#### Simulation conditions

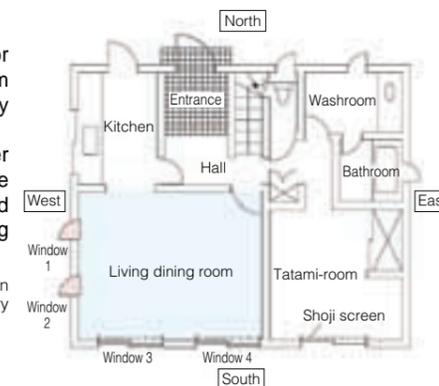
Confirm the difference of the air conditioner's electric power consumption, electric power cost and CO<sub>2</sub> emission between the living dining room with 4 curtains hung at the windows and the living dining room without curtains.  
Calculation program  
Calculation program for transient heat load in multiple rooms. "LESCOM-suminoe"  
Weather data  
Standard weather data (Tokyo)  
Calculated target  
Living dining room of 20.5 m<sup>2</sup> at the first floor of two-storied house  
• Reference to the standard house problem proposed at the thermal symposium of Architectural Institute of Japan  
Window  
West side 2 windows (1.2 m<sup>2</sup>), south side 2 windows (6.4 m<sup>2</sup>)  
Glass  
3 mm clear glass  
Energy-saving effect on this page is calculated by LESCOM-Suminoe and not guaranteed, and changed by the actual construction methods and use environment. Please use as criteria for selecting curtains.

► Energy-saving performance for curtain is calculated by LESCOM-Suminoe simulation program.

"LESCOM-Suminoe" is developed program for calculation of curtain energy-saving performance from LESCOM\*2 by Prof. Hitoshi Takeda, Tokyo University of Science.

LESCOM-Suminoe can calculate electric power consumption under supposed condition with some character of the curtain. It can calculate all area and all season in Japan and change the setting temperature of air conditioner.

\*2 LESCOM (Life Energy Saving Computer Method) is a simulation program for heat load calculation developed under the Ministry of International Trade and Industry.



# Environment-friendly technology

## Scrap stage Prevention of pollution

### Processing technology of olefin floorcovering

With a purpose to reduce a load on environment, we are now developing processing technology for new-generation floorcoverings by adopting olefin resin in the floorcovering area 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 ST." 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 functions

##### ◆ Comparison of combustion (ppm)

Item	Polyolefin flooring	PVC flooring
Carbon Dioxide (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 (SO <sub>2</sub> )	No detection	No detection

##### ◆ Slip resistance tester



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 slipperiness and it evaluates safety against slipperiness in walking.

##### ◆ Comparison of smoke generation (Ds)

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

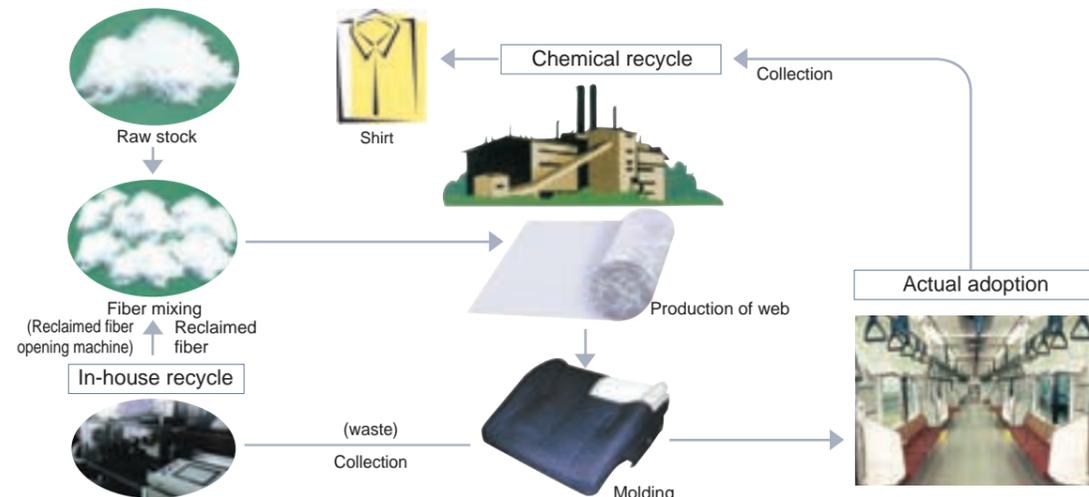
## Scrap stage Recycling technology & recycling system

### Polyester fiber elastic structural material as seat cushion for railway transportation

Used materials are collected and chemically recycled (polymer ⇒ depolymerization ⇒ monomer (purity: 99.99%) ⇒ polymerization ⇒ polymer) to be used as materials for clothes like shirt.

As this system is an in-house recycle system to reuse waste generated in the process, it is possible to make wastes nearly zero.

#### ● Recycle flow of elastic structural seat material



# Environment-friendly products ● Interior decor business

A list of products (for general houses, hotels, offices, hospitals and public institution)

Effect on environment	Product	Description	Usage			
			Carpet	Curtain	Hard flooring	Wall paper
Purification of indoor environment	Triple-Fresh® II	Absorb and decompose formaldehyde etc. from indoor air	○	○		
	TF-V	Absorb and decompose formaldehyde etc. from indoor air				○
	Triple-Fresh® Plus	Triple-Fresh® plus personal care		○		○
	Low formaldehyde product	Low formaldehyde product approved by IFPEC* (F☆☆☆☆)	○	○	○	○
	Allerbuster®	Suppression of mite-allergen and pollen-allergen activity by coating	○			
	Allercrush®	Suppression of mite-allergen and pollen-allergen activity by coating		○		
	Aller-Block®	Suppression of mite-allergen and pollen-allergen activity by absorbing to the interlayer	○	○		○
	CLEANSE™ antiviral activity process	Antiviral activity process for the textile product	○	○		
	Sound insulation Sound-guard	Indoor and outdoor sound insulation	○	○		
	Sound absorption	Indoor sound absorption		○		
Recycle	Anti-mite treatment	Mite evasion product approved by IFPEC*	○			
	Blockthrough	Carpet pile and backing fabric shed water well and permeate floor humidity	○			
	Production and use of Sumitron® (polyester) yarn	Recycled from PET bottle	○	○		
	Carpet tile recycle system	Collect used carpet tiles and change into raw material	○			
Energy-saving Resource-saving	Curtain recycle system	Collect used curtain fabrics and use them in other usage		○		
	eAccess-floor "SE-Light N" series	Using reclaimed polypropylene beer case	○			
	NOKORI DYE®	Dyeing with the material from food waste	○			
	CO <sub>2</sub> emission reduction with Life-Cycle-Assessment	Evaluating the environmental impact from cradle to grave	○			
	Solution dyed yarn	Reduction of waste water and energy at dyeing process (the yarn needs no dyeing)	○	○		
	Self-adhesive carpet tile Caesar-fit	Resource-saving by using re-usable adhesive container	○			
	Designated products by law on promoting Green Purchasing	Green mark products with low environmental impacts	○	○	○	
	Products acquired Eco Mark	Eco Mark products for environmental protection	○	○		
	Warming technology (Warm Eco treatment)	Carpet absorbs moisture from a body and treated materials generate heat.	○			
	Heat block curtain	Energy-saving curtain which block outdoor heat.		○		
Energy-saving Resource-saving	Products made from natural fiber materials	Resource-saving products with natural renewable materials.	○	○		
	Ecodear®	Reduction of CO <sub>2</sub> emission using PLA bio-mass fiber	○			
	Energy-saving curtain "plus ECOLOGY"	Energy-saving performance calculated by LESCOM-Suminoe system		○		
	Cooling technology (Cool Eco treatment)	Special micro capsules absorb body heat quickly.	○			
	SARACOOL®	Heat block voile curtain using SARACOOL® fiber		○		
	SUZUSHIYA®	Heat block lace curtain using SUZUSHIYA® fiber		○		
	Aluminum and acrylic coating	Heat and sound block curtain using aluminum and acrylic coating		○		

\* IFPEC (Interior-fabrics Performance Evaluation Conference)



### Designated procurement goods by Law on Promoting Green Purchasing

696 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 10% 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 696 items in this "designated products". Suminoe positively promotes Green Purchasing by showing mark on these products.

Special note: The standard of "recycled plastic ≥25%" was revised from "recycled plastic ≥10%" at Feb 2010. But the products of "recycled plastic ≥10%" can be on sale up to Mar 31, 2011 as a temporary measure. Registered 696 items above contain both standard products.

Curtain (266 items), Carpet tile (141 items), Piece carpet (10 items), Polyvinylchloride floor material (279 items)...Total 696 items (as of end of June 2010)



Curtain mode S



### Products acquired Eco Mark

186 items of Carpet, Curtain and eAccess-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.

# Environment-friendly products ● Interior decor business

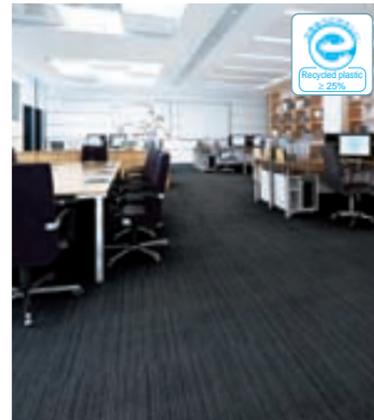
## “LX-1000 ECO”

- (1) It is a state-of-the-art carpet tile much more ecological, energy-saving and comfortable for office space.
- (2) Surface pile yarn is solution dyed Nylon yarn and needs no dyeing process with much water.
- (3) LX-1000/1100 is virgin PVC backing, but LX-1000 ECO is recycled PVC backing (recycled material ≥25%) and acquired Eco Mark.
- (4) It has 2 types of textures “stripe and random High & Low”. It is fitted for various office spaces by color pattern and design.

### Products line up

Carpet tile “SG-400” “SG-300”, Roll carpet “ECOLOA100”, OA floor “SE-Light N”, Rugs “SMITRON® SAXONY”, “SMITRON® TWISTY” and “BOTANICAL”

Curtain (41 items), Carpet tile for office (57 items), Roll carpet (12 items), Rug & Piece carpet (70 items), eAccess-floor “SE-Light N” series (6 items)... Total 186 items as of end of July 2010.



Construction sample



## Carpet for CO<sub>2</sub> emission reduction with Life-Cycle-Assessment

### ECOLOA 100

Reduces CO<sub>2</sub> emission by 30% as compared with nylon solution dyed roll carpet.

It makes use of Sumitron®, polyester yarn that contain 50% or more reclaimed materials from PET bottle.



Construction sample

### SUMI-GREEN SG400/300

Reduces CO<sub>2</sub> emission by 19% as compared with nylon dyed carpet tile

SUMI-GREEN SG-400/300 are epoch-making carpet tiles containing recycled material both in the surface pile SUMITRON® yarn and recycled PVC backing.



Construction sample

### SUMITRON® home rug carpet

The interior décor industry's first rug carpet products that acquired the Japanese Eco Mark.



## plus ECOLOGY curtain

### Energy-saving performance calculated by the LESCOM-Suminoe system

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

● **Heating effect** For thick curtain, bigger value means higher energy-saving.

▼15% ▼10% ▼5% ▼4% or less

● **Cooling effect** For thin curtain, bigger value means higher energy-saving.

▼20% ▼15% ▼10% ▼9% or less

Energy-saving performance for curtain is calculated by the LESCOM-suminoe system. "LESCOM-suminoe" is developed program for calculation of curtain energy-saving performance form LESCOM (Life Energy Saving Computer Method) by Prof. Hitoshi Takeda, Tokyo University of Science.

### Products line up

All items in “mode S Curtain Catalog Vol. 5”



## Triple-Fresh® Plus wall paper and curtain

“Triple-Fresh + Plus Care” wall paper is evolutionary version of TF-V wall paper and effective for 3 personal care odors (perspiration odor, aging odor, stool odor)\*. The cycle deodorization mechanism by catalyst shows continuous effect without electric power and sunlight.

\* Isovaleric acid (perspiration odor), nonenal (aging odor) and indole and skatole (stool odor)

### Products line up

Wall paper “Triple-Fresh + Plus Care”  
Curtain... some items in “face contract curtain Vol.16+”



## Aller-Block® wall paper, curtain and carpet

“Aller-block” was developed to give a new function of anti-allergen to wall paper. “Aller-block” can suppress allergen activity by absorbing to the multilayer structure made from inorganic materials from natural mineral and has high durability even after high temperature treatment.

### Products line up

Rugs “SUMITRON GLAIN”, “SUMITRON HARMONY”, “NEOGLASS”, “SUMITRON DUO”, “LAX FUR”, “GLASS WEB” and “SHARON”, Wall paper “Anti-allergen wall paper Aller-Block”, Curtains... some items in “face contract curtain Vol.16+” and “Design Life Edition 4”



## CLEANSE™ Antiviral activity treatment for the textile product such as curtain and carpet

Antiviral activity treatment “CLEANSE™” can decrease viral infectivity. Joint study of KURABO and Suminoe apply CLEANSE™ to curtain and carpet. This antiviral agent is made from oral antiseptic and testified high safety. CLEANSE™ products are expected to be widely used not only for medical but school sport clothes and others.

### Products line up

Some items from Rug “GLASS WEB” “SHARON”, Piece carpet... some items in “Piece carpet Vol.1”  
Some items from Curtain “face contract curtain Vol.16+”  
Some items from Curtain “Design Life Edition 3”



## NOKORI DYE® mat

“NOKORI DYE MAT” is the ecological mat which is made with the yarn dyed with *nokori* (residue) of foods, such as chestnut shells given from traditional Japanese confectionaries, or parsleys, blueberries after squeezed their juice. All foods are domestic, and “NOKORI DYE MAT” has deep and soft colors from natural materials. “NOKORI DYE MAT” is a combination of strong wool and gentle plant-derived Tencel fiber, and the design is so simple that they are loved long by their users.

With the aim at changing our lives from throwaway into reusing, each piece of “NOKORI DYE MAT” is carefully made in designated domestic factory.

### Products line up

“Budou” (grape), “kuri” (chestnut), “paseri” (parsley), “azuki” (azuki bean), “blueberry”

### Won The GOOD DESIGN AWARD 2010

#### Comment of the judge

This product is made using the traditional method of herb dye. Excepting the present age of chemical dyes, human have had the wisdom to put the virtues of natural plants to use in their lives. This product, applying the food industrial waste as dyes, is also expected to have the effect of polyphenol that contained in chestnut shells or grapes, or the antibacterial and anti-odor effect in parsley. This is a very gentle product that reminds us of the relationship between human and nature.



# Environment-friendly products ● Industrial material business

A list of product (for automobile, railway, bus and ship)

Category	Products	Description	Usage	
			Automobile	Railway etc.
Improvement of indoor environment	Triple-Fresh® treatment	Formaldehyde and cigarette smoke and major 4 bad life odors in a car are absorbed and decomposed.	○	○
	Face fabric for car seat (low formaldehyde)	Backing material with low formaldehyde is used.	○	○
	Car seat fabrics with skin care treatment Ato-Guard®	Textile fabrics with "chitosan" and "collagen"	○	
	Car seat fabrics with anti-allergen treatment	Suppression of mite-allergen and pollen-allergen activity by absorbing to the interlayer.	○	
Recycle	Seat cushion material for railway vehicles SumiCube®	Recyclable polyester fiber elastic structural material		○
Prevention of pollution	PVC-free car mat	Polyolefin backing material is used.	○	
	PVC-free car accessories	Polyester yarn and polyolefin backing material are used.	○	
	PVC-free flooring in a transit vehicle	Polyolefin resin is used.		○
Energy-saving Resource-saving	Eco-fabric	More than 50% reclaimed recycled yarn is used.		○
	Swing-net® car seat	Three dimensional knit fabric with Sumitron yarn (lightweight)	○	
	Sound absorbing carpet and mat for cars	Non-woven backing material used (lightweight)	○	



## Eco-fabric with Eco Mark\* Fabric corresponding to "Green Purchasing"

### Recycled PET yarns are used 50% or more

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



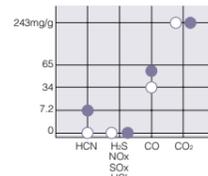
## Seat cushion material for railway vehicles

### 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 longtime. 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, so that it is a safe material.

It is adopted as KiHa 189 Hamakaze as cushion material of a back reclining portion.

### Comparison of combustion gas



● Urethane ○ Polyester fiber elastic structural material  
JIS K 2541 combustion at 400°C



JR-WEST Limited express Hamakaze



## Polyolefin Anti-slip floor film

### OH Film S

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

Environment: Less poisonous gas such as HCN and HCl

Safety: High anti-slip and durability under the wet and dry condition.

Kindness: Display by print "NOTICE", "GUIDANCE", "ATTENTION", etc.



OH Film S: JR-WEST Diesel multiple unit



## Polyolefin warning film

### OH Film B

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: Mie Bus Association

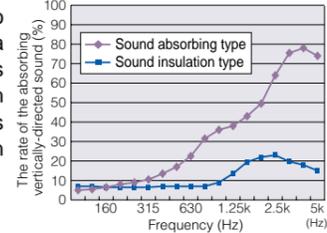


## Sound absorption carpet and mat for cars

We have developed a floor carpet to improve the silence of a car room as well as to save the weight of a car.

The current method of increasing insulation property is to make the resin layer on the back of a carpet heavier. In order to realize a weight saving and insulation improvement at the same time, a resin layer of a sound absorption carpet is replaced with the felt of low specific gravity. By using this technology, high sound absorption and attenuation function are attained. In addition, a road noise is also absorbed and we can expect a big effect on reducing noises which are coming through ceiling or windows. This technology is diversely used in option mats, floor carpets, etc.

### The sound absorbing comparison of the floor carpet



Floor carpet



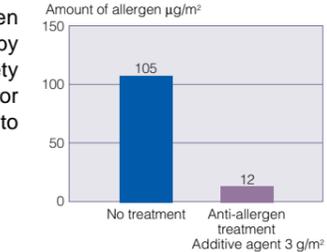
Option mat



## Car seat fabrics with anti-allergen treatment

Seat fabrics which suppress the function of mite-allergen and pollen-allergen activity by coating. We offer the safety and healthy indoor space for infants and sensitive people to allergen.

### ELISA: enzyme-linked immuno-sorbent assay



Additive agent 3 g/m²



Seat fabrics with anti-allergen treatment: MAJESTA TOYOTA

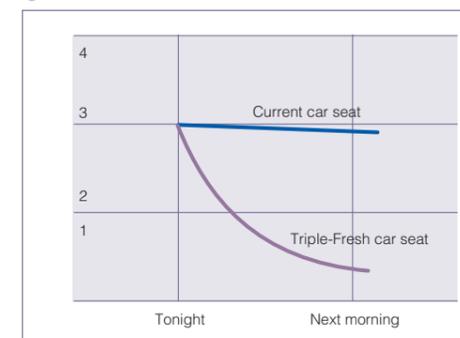


## Headliner & seat fabric with odor destroying function

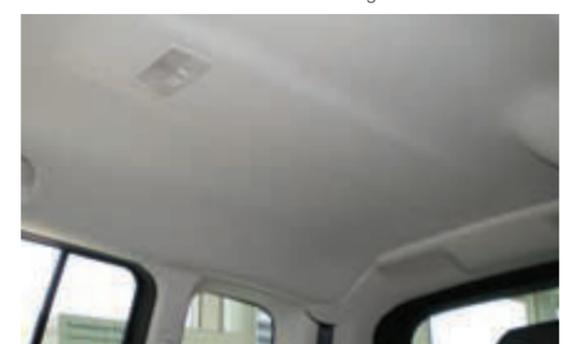
### Triple-Fresh® treatment

Bad odor from pets or cigarette in a car is absorbed and decomposed by applying Triple-Fresh® treatment on headlining or seat fabrics. You will hardly notice these odor in your car on the next day. It also reduces chemical substances emitted from interior parts. Suminoe could realize an interior space with safety materials for you and your family. Triple-Fresh treatment is a new eco-friendly technology to absorb and decompose odor from formaldehyde, cigarette, major 4 bad life odors. Suminoe has developed this technology firstly in the industry.

### Purification index of bad odor in car



Deodorizing fabric: MOCO NISSAN



Deodorizing headliner: PREMACY MAZDA

# Environment-friendly products ● Functional materials business

A list of products (for design seeking media, interior, industrial equipment, material for environmental conservation)

Category	Products	Description	Usage
Energy-saving Resource-saving	Breathable heat shield roofing sheet	Roofing sheet with breathable 5 layers structure	Construction
	True Art system	Jet print special pigment ink on film or fabrics	Media
	Nassenger	Ink-jet print special dye stuff on fabrics	Media
	3-D knit fabric (Swing Net)	Superior pressure dispersibility and lightweight cushion material	Industrial materials
Prevention of pollution	OH TILE®/Polyolefin for transit vehicle	Polyolefin hard flooring	Interior
	Total water shield system	Special water shield system in final waste disposal site	Construction
	Sumitron® yarn (PET filament)	No toxic gas like chlorine gas or cyan gas at incineration	Interior
Purification of indoor environment	Air freshener Tispa series	Consumer product used in homes that mitigate unpleasant odors	Home appliance
	Triple-Fresh® Bio	Odor destroying filter for refrigerator, air conditioner, ventilating fan	Home appliance
	Self-fresh	Auto-reclaiming filter for air purifier in the buildings, subway, factories	Industrial equipment

## Protection of pollution / Improvement of indoor environment Air freshener Tispa series (Tune to infinite special air)

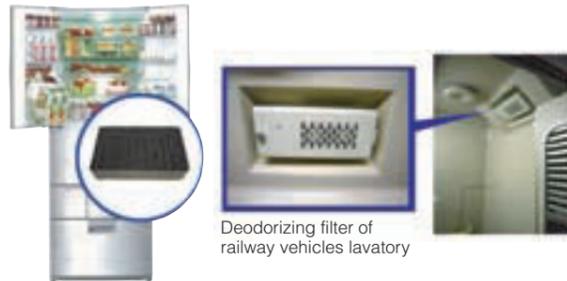
Air freshener Tispa series (Tune to infinite special air) are consumer products used in homes that mitigate unpleasant odors of refrigerator and lavatory. True deodorant without fragrance Tispa have 3 types for refrigerator, lavatory and shoes cupboard.



Tispa

## Protection of pollution / Improvement of indoor environment Air-filter product group

"Triple-Fresh® Bio" is a new concept of deodorizing filter that biomimetic enzyme is invested in corrugate carrier. It continuously deodorizes unpleasant odor gas. Biomimetic enzyme works as catalyst, and decomposes and deodorizes unpleasant odor components by oxidation-reduction reaction. Therefore its validity is semi-permanent.



Triple-Fresh® Bio filter

Deodorizing filter of railway vehicles lavatory

## Protection of pollution Water purification filter (SUMITRON yarn filter)

SUMITRON yarn featured with modified cross section and high crimp is used as purifying filter. It has been used as a water purifying filter which can remove contaminants in the water by the modified cross section and crimp modulus. It can be used repeatedly by reverse cleaning.



Water purifying filter

## Protection of pollution Polyolefin flooring products

### OH TILE® and OH Sheet S

Flooring made from polyolefin resin emits little smoke and no toxic gas when it burns. Compared with polyvinyl chloride flooring, our new polyolefin flooring has excellent durability, chemical resistance and easy-maintenance property that keep floorings beautiful. This flooring is used for railway vehicles and elevators required high level of safety.



OH Sheet S  
JR-EAST 485



OH TILE® Toshiba Elevator

## Protection of pollution Special water shield system at disposal site

### Total water shield system

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.

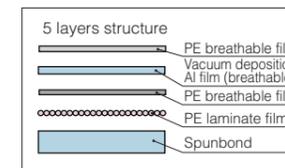


Protective sheet at disposal site

Temporary construction sheet

## Energy-saving & resource-saving Breathable heat shield roofing sheet

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

## Energy-saving & resource-saving Ink-jet printing

### True art/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.



Wakayama Electric Railway "TAMA" train

## Energy-saving & resource-saving 3 dimensional knit fabric

### Swing-Net®

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 cushion 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 lightweight.



Car seat (3D-NET)

Structure of cross section