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.

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 improvement global environment and hand the beautiful earth to our descendants.

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 Tejin Techno Co. Ltd. In line with that, Tejin Tecloth 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 CO2 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 CO2 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.

Ichizo Yoshikawa
President,
Suminoe Textile Co., Ltd.

January 2011
**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 sustainable society. But furthermore, our company has been participating in “Collaborative Innovation Center for Nanotech FIBER” of Shinshu University to create 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

**Production Stage**
- Recycling technology & Recycle system
  - (In-house wastes and recyclable materials are targets)
- Energy-saving technology
- Resource-saving technology
- Environment improvement program

**Use stage**
- Technology to improve space living environment
  - (Approach to health and comfort)
- Energy-saving technology
- Resource-saving technology
- Indoor environment improvement program

**Scrap stage**
- Recycling technology & recycle system
  - (Used products are targets)
- Technology to prevent pollution
  - (Alternatives to used chemical substances are main targets)
- Reduce technology of PRTR Agent

**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 technology
- 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 engineeering with the takumi (master’s) expertise that the collaborative industries have kept.
- It aims to achieve the health and energy revolution made by nanotech fiber, and to make healthy and sustainable society real.

Ministry of Economy, Trade and Industry
- FT2010 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

**Environmental consciousness of products valued through LCA**

LCA is “life cycle assessment” and 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**
  - CO2 reduction: 30% emission
  - The small and medium enterprise agency called for R&D project proposals for its program to support the 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 technology.

- **SUMI-GREEN SG-400/300**
  - CO2 reduction: 19% emission

**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 biomass derived fiber easily replaced with oil derived PET fiber. SUMINOE TRS TECHNO Co., Ltd. has developed sugar cane-derived biomass 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 fabric 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 CO2 emission and load on environment.

**Comparison of performances of bio materials**

- Oil derived PET: 255°C
- Bio Master: 220°C
- Bio PTT: 230°C
- PLLA: 170°C

- Melting point: 255°C
- Degree of biomass: 30%
- Thermal stability: 30%
- Strength decline: 20%
- Light resistance: 50%
**Recycle process of SUMI-GREEN SG-400·300**

- **Recycle process of used PET bottle**
- **PET bottle flakes**
- **Polyester chip**
- **Spinning & Texturizing**
  - **Pile yarn (PET) Sumitron**
- **Tufting**
  - **Carpet yarn**
- **New high performance tufting process**
  - **Carpet tile cutting & packing process**
  - **Used product collection**
- **Recycle flow of carpet tile wastes from production process**
  - **Square waste**
  - **Cut waste**
  - **Crush, granulate, and pelletize**
  - **Recycle to building-material sheet**
- **Recycle flow of used carpet tiles**
  - **Used carpet tile (PVC backing)**
  - **Surface layer (textile)**
  - **Backings layer (resin)**
  - **Grind**
  - **Pressurized granulation**
  - **Push roller**
  - **Cold and high pressure air nozzle**
  - **Take out conveyor**
- **Recycle flow of carpet tile wastes**
  - **Used carpet tile**
  - **Fiber-opening machine**
  - **Heat sealed process**
  - **Opening fibers of polyester are mixed with low melting polyester**
  - **Pressure bonding roller**
  - **Noise absorbing material**
  - **Opening**
  - **Felted waste process**
  - **Acoustic materials on the dashboard**
  - **Pressure bonding roller**
  - **Heat sealed process**
  - **Opening fibers of polyester are mixed with low melting polyester**
  - **Recycling technology & recycling system**
  - **Recycle flow of needle punched non-wovens**
  - **Recycle flow of automobile carpet from production process**
  - **Recycle flow of sludge**

**Production Stage**

**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-processed by this splitting machine.

**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 system to dry and reduce weight of sludge**

- Sludges which are purified and disposed from water waste are re-processed 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.
**Environment-friendly technology**

### 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 twice stronger.

It not only absorbs odors simply, but chemically decomposes into harmless ingredients as water and CO₂ 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.

**Mechanism & performance**
- Time course of odor index absorbing animal smell
- Odor contribution rate of absorbing animal smell

**Comparison of deodorant power**

**Structure of Triple-Fresh Bio**
- Physically absorbing function and chemically decomposing function.
- Functional group: Chemical absorbing
- Activated carbon, sponge, wood: naturally absorbing function
- Artificial enzyme support: decomposition function

**Mechanism & performance**
- Physically absorbing function and chemically decomposing function

**Comfortable space**
- Effective combination for bad odor

**Fragrance & flavor analyzer**

### 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

### Cooling technology (cool eco treatment)

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

Since body temperature is absorbed when the substance enclosed in the microcapsule releases body temperature, it is called cool.

**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 humel environment, textile already absorbs moisture, it never generates heat.

**Mechanism & performance**
- Heat generation by moisture absorption
- 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.
- The characters of Ato-Guard are greater in all categories.

**Mechanism & performance**
- Skin irritation test <1>
- Mutagenicity test (Ames test) <1>
- Skin sensitization test <1>

**Amino Clean**
- We have also developed a technology to process textile by compounding “Amino-free”—skin care process using egg shell membrane and “Kohmin Master”—anti-bacteria and anti-mold process.

**Mechanism & performance**
- Test for safety:
  - Test for antimicrobial activity: bacteriostatic activity value ≥ 2.2, 5 times washingConfirmation of safety
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.

Backicotless Fabric

New fabric with jaccard 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 drap performance.

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 width 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.

Use stage Lightweight and pollution control

Lighter by about 30%

Lighter by about 30% by applying just a small amount of scattered specific nano-size filler.

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.

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.

Use stage Energy saving

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

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

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

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

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

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

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

* "LESCOM Life Energy Saving Computer Method" is a simulation program for heat load calculation developed under the Ministry of International Trade and Industry.
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®” which is easy to be installed and has an anti-slippery function to follow olefin line “OH TILE®” and olefin long sheet “OH SHEET®”. 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.
- **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 adhesives is applied on back face.
- **Design**: As the mat itself is transparent, various designs are available by printing.

Recycle flow of elastic structural seat material

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

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

Polyester fiber elastic structural material as seat cushion for railway transportation

Effect of environment

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPE-FOAM</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
<tr>
<td>TPE-PAVE Plus</td>
<td>Carpet, Curtain, Textile, Other use</td>
</tr>
</tbody>
</table>
**Environment-friendly products**

"LX-1000 ECO"

1. It is a state-of-the-art carpet tile made of PET bottle and is 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-1000/1200 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-100" "SG-300" Roll carpet "ECOLOA100", OA floor "SE-Light N". Rugs "SMITRON SAKONY", "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 (8 items). Total 186 items as of end of July 2010.

**Carpet for CO2 emission reduction with Life-Cycle-Assesment**

**ECOLOA 100**
Reduces CO2 emission by 30% as compared with nylon solution dyed roll carpet. It makes use of Sumitrons, polyester yarn that contain 50% or more reclaimed materials from PET bottle.

**SUMI-GREEN SG400/300**
Reduces CO2 emission by 19% as compared with nylon dyed carpet tile. SUMI-GREEN SG400/300 are epoch-making carpet tiles containing recycled material both in the surface pile and recycled PVC backing.

**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 thin curtain, bigger value means higher energy-saving.

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

**Triple-Fresh+ Plus wall paper and curtain**
"Triple-Fresh + Plus Care" wall paper is evolutionary version of TF-W 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.

**Aller-Block+ wall paper, curtain and carpet**
"Aller-Block" was developed to give a new function of allergen activity by absorbing to the multilayer structure made from inorganic materials from natural mineral and has high durability even after high temperature treatment.

**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 textiled high safety. CLEANSE+ products are expected to be widely used not only for medical but school sport clothes and others.

**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**
- NOKORI DYE+ mat

**Win The GOOD DESIGN AWARD 2010**
Comment of the judge
This product is made using the traditional method of herb dyes. 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.

---

*Environmental Report 2011* Suminoe Textile  
Suminoe Textile, Environmental Report 2011
Environment-friendly products

<table>
<thead>
<tr>
<th>Category</th>
<th>Products</th>
<th>Description</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement of indoor environment</td>
<td>Triple-Fresh treatment</td>
<td>Formaldehyde and cigarette smoke and major 4 bad life odors in a car are absorbed and decomposed</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>Face fabric for car seat (low formaldehyde)</td>
<td>Backing material with low formaldehyde is used.</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>Car seat fabrics with skin care treatment: Ato-Guard®</td>
<td>Textile fabrics with &quot;chitosan&quot; and &quot;collagen&quot;</td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>Car seat fabrics with anti-allergen treatment</td>
<td>Suppression of mite-allergen and pollen-allergen activity by absorbing the allergen</td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td>Recycle</td>
<td>Seat cushion material for railway vehicles: SumiCube®</td>
<td>Recyclable polyester fiber elastic structural material</td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
</tbody>
</table>

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)

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

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 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.

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.

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.

Deodorizing fabric: MOCO NISSAN

Deodorizing headliner: PREMIUM MAZDA

Option mat

Seat fabrics with anti-allergen treatment: MAJESTA TOYOTA

Comparison of combustion gas

Eco-fabric: Keihin Kyuko Bus Haneda Airport KÉKIU LIMOUSINE
Environmental Report 2011

Environment-friendly products ● Functional materials business

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

<table>
<thead>
<tr>
<th>Category</th>
<th>Products</th>
<th>Description</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy-saving Resource-saving</td>
<td>Breathable heat shield roofing sheet</td>
<td>Roofing sheet with breathable 5 layers structure</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>True Art system</td>
<td>Jet print special pigment ink on film or fabrics</td>
<td>Media</td>
</tr>
<tr>
<td></td>
<td>Nassenger</td>
<td>Ink-jet print special dye stuff on fabrics</td>
<td>Media</td>
</tr>
<tr>
<td>Prevention of pollution</td>
<td>OH TILES/Polylefin for transit vehicle</td>
<td>Polyolefin hard flooring</td>
<td>Interior</td>
</tr>
<tr>
<td></td>
<td>Total water shield system</td>
<td>Special water shield system in final waste disposal site</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>Sumitron yarn (PET filament)</td>
<td>No toxic gas like chlorine gas oryoutu gas in air conditioning</td>
<td>Interior</td>
</tr>
<tr>
<td>Purification of indoor environment</td>
<td>Air Freshener Tispa series</td>
<td>Consumer product used in homes that mitigates unpleasant odors</td>
<td>Home appliance</td>
</tr>
<tr>
<td></td>
<td>Selffresh</td>
<td>Auto-reclaiming filter for air purifier in the buildings, subways, factories</td>
<td>Industrial equipment</td>
</tr>
</tbody>
</table>

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.

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.

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.

Polyolefin flooring products

OH TILES® 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.

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 “Baras®” 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.

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 reflects 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.

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 dying 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.

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.

Environmental Report 2011

31 Suminoe Textile Environmental Report 2011

32 Suminoe Textile Environmental Report 2011