



Asian Productivity Organization



For sustainable production & consumption

# ECO-PRODUCTS DIRECTORY 2010

1000 eco-materials, -components, -products and -services are contained,  
with more than 550 categorized as effective in preventing global warming.

## Environmental considerations in publishing the Eco-products Directory 2010

The Eco-products Directory 2010 uses paper certified by the Forest Stewardship Council (FSC) for its cover and main body. The FSC logo indicates that the wood used to make the product comes from a forest that is carefully managed according to strict environmental, social and economic standards. The forest of origin has been independently inspected and evaluated according to the principles and criteria for forest management agreed and approved by the Forest Stewardship Council.

The environmentally friendly waterless printing process adopted uses 100% vegetable oil-based ink free of Volatile Organic Compounds (VOCs).

This book conforms to the Purchasing Guidelines for Offset Printing Service (GPN GL-14) established by the Green Purchasing Network (GPN).



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# Foreword

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The Asian Productivity Organization (APO) has been expanding its role and contributions in addressing the challenges of achieving sustainable growth through its Green Productivity (GP) Program. GP is a tailored program that caters to the needs of member countries to increase productivity while avoiding external diseconomies in the 21st century. The program comprises knowledge- and skill-imparting activities such as training courses, seminars, and workshops, as well as large-scale public events such as the Eco-products International Fairs (EPIFs) and publication of the *Eco-products Directory*.

The *Eco-products Directory* focuses on promoting the concept and practice of environmentally responsible purchasing among enterprises and consumers in the region. The first *Eco-products Directory* debuted at the EPIF in Kuala Lumpur, Malaysia, in 2004, with five subsequent volumes published annually up to 2009.

This sixth edition of the *Eco-products Directory* was published in conjunction with the opening of the EPIF 2010 in Jakarta, Indonesia, in March. 500 copies were distributed to the chiefs of state and cabinet members of governments in the APO membership and beyond. The user-friendliness of the latest edition was increased by featuring more detailed descriptions to facilitate purchasing decisions that will result in a smarter, more sustainable society.

Starting from 754 eco-products and eco-services listed in the 2004 directory, each new volume has included a wider range of more listings. Among more than 1,000 data entries submitted, the present *Eco-products Directory* contains 1,000 eco-products and -services developed by environmentally advanced enterprises, of which nearly 550 are categorized as energy saving, more than 550 as effective in preventing global warming, and around 450 as helping to reduce the consumption of resources. I hope that this publication will contribute to an appreciation and expansion of eco-product and -service markets in the Asia-Pacific region.

Our sincere thanks go to Professor Ryoichi Yamamoto, Chairperson of the Committee on the Eco-products Database, and all members of the working group for their dedicated leadership and efforts that made this publication possible.

Shigeo Takenaka  
Secretary-General

Tokyo  
January 2010



## Dear Readers

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The area of the Arctic Ocean covered with sea ice in September 2009 was the third smallest since satellite observation began, although it was slightly larger than the level seen in 2007. Some even predict that summer sea ice will be completely gone in ten to twenty years. It is further feared that ocean acidification will also have a serious impact on ecosystems a few decades from now. Experts warn that if no action is taken, global warming will cause major disruptions to our health, ecosystems, industries, social infrastructure and various other areas.

Society has also developed a heightened level of sensitivity to the issue of global warming. Tokyo's Eco-Products 2009 exhibition (an event to showcase environmentally friendly products) attracted 182,000 visitors, with more than 750 businesses running booths. The Eco-products International Fair 2008 held in Hanoi, Vietnam, welcomed approximately 100,000 visitors. An increasing number of music concert and sports event organizers now make efforts to offset the CO<sub>2</sub> emissions generated from the events they host by planting trees. In addition, businesses have ventured into the area of food and other products bearing carbon footprint labels that indicate the total amount of CO<sub>2</sub> and other greenhouse gases emitted during their life cycles.

Environmental issues have also gained prominence in the media, with TV programs and newspapers reporting on environmental matters every day. Although more than 7,000 products now bear labels certifying their green status, information about products and services that help mitigate environmental impact often does not reach us. As a result, many people struggle to come up with a clear-cut answer when considering how to minimize damage to the environment.

To guide us toward the development of an environmentally friendly society, each one of us must have a solid understanding of the answers to the following two questions: "What problems does today's society face?" and "How can I help to address them?"

Industry can make a social contribution by providing goods and services that are environmentally friendly or that reduce their environmental impact - commonly referred to as eco-products.

Industry is actively working to develop eco-products and services and make them widely available to help society. However, regardless of how wonderful eco-products might be, if they do not gain enough popularity to replace existing products, they will not be effective in reducing environmental damage. Accordingly, efforts must be made to inform consumers of the types of eco-products and services available.

The *Eco-products Directory* has been published by the Asian Productivity Organization (APO) since 2004, and represents a comprehensive guide to a range of eco-products currently on the market. To date, 3,400 eco-products and services have been included in this directory.

The *Eco-products Directory 2010* offers consumers:

- Straightforward listings of 1,000 leading-edge eco-products
- Clear explanations of the varieties and characteristics of the eco-products listed

To satisfy the above conditions, the APO established the Eco-products Directory 2010 Working Group and held multiple meetings aimed at tailoring the information contained to ensure that it is genuinely useful in helping consumers to better understand the contents of the directory.

The year 2010 promises to be an extremely important period in the earth's history. Post-Kyoto Protocol negotiations on greenhouse gas emissions are underway worldwide in tandem with a global trend of efforts to overcome the current economic downturn caused by financial turmoil through the Green New Deal initiative. An integral part of these processes is the popularization and widespread use of environmental impact-reducing technologies and eco-products. We therefore believe that the *Eco-products Directory 2010*, which itemizes such technologies and products, is a tremendously valuable resource.

In editing this directory, we received the generous cooperation of parties across a wide variety of fields including universities, research centers and NPOs. The Society for Non-Traditional Technology also dedicated itself to the completion of the project. I would like to take this opportunity to express my sincere gratitude to all concerned.

Ryoichi Yamamoto

Professor, Institute of Industrial Science & International Research Center  
for Sustainable Materials, University of Tokyo  
Chairperson of the Committee on the Eco-products Database of the APO  
Vice chairperson of the GP Advisory Committee of the APO



# Visualization of Product Environmental Information

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Resolving the issues of global warming and resource depletion requires that businesses with environmentally conscious output encourage consumers to become more aware of the environment when selecting and using products; such awareness can be achieved by providing quantitative information and other kinds of specific environmental enlightenment about their goods. In other words, it is important to forge relationships of trust between product providers and users through facilitated communication on environmental information.

In this regard, three points are considered important. First of all, the information provider, i.e., the industry itself, should have a deeply rooted evaluation system. One technique for evaluating the environmental impact of products is Life Cycle Assessment (LCA). In Asia, the dissemination of LCA among domestic businesses is in progress with database expansion under way to establish LCA systems, and interested businesses have begun working toward the introduction of labeling in line with Type III environmental declarations and carbon footprint systems. In addition, the current international nature of supply chains makes it favorable for each nation to work to enable the communication of quantitative environmental information among overseas production bases. Cooperation regarding LCA systems has begun in various countries in Asia. By way of example, Thailand held a workshop in November 2009 on LCA systems, including exchanges of opinions, with the participation of invited experts from eight Asian nations.

The second point is the need to establish a framework for objective assessment and to explicitly describe the details of such assessment to the recipients of the information, i.e., product purchasers. For LCA systems, assessment results differ significantly depending on the pre-determined assessment framework, and making this framework transparent is important in product labeling. Type III environmental declarations are environmental labels bearing quantitative information standardized by the International Organization for Standardization (ISO) in order to resolve these issues, and specify LCA assessment in a manner acceptable to markets. Historically speaking, Type III environmental declarations have been operated as national programs concurrently with the process of establishing ISO 14025. In Japan, LCA information on over 900 products has been disseminated in the form of Type III environmental declarations.

The third point is ease of understanding for product environmental information. Type III environmental declarations are intended for use in business-to-business (B to B) communication and business-to-consumer communication (B to C) concerning end products. In particular, product environmental information in B to C communication must be made easier to understand. Currently, in an effort to enhance the environmental awareness of the general public by disclosing information on CO<sub>2</sub> and

other greenhouse gas emissions on a product level to consumers, a carbon footprint system is being established around the world. Accordingly, the ISO is also formulating relevant international standards. In Asia, countries such as Japan, South Korea and Thailand have begun implementing, on a trial basis, carbon footprint programs in which relevant information is made available at the storefront level.

As visualizing product environmental information (and thus establishing environmental communication among stakeholders) contributes to the improvement of product design and the development of new technological fields, I believe this approach will be increasingly expected to serve as an effective part of creating eco-products.

Last but not least, many environmental problems, such as global warming, arise from the ways in which materials and energy enter and exit the natural environment and product systems in the product cycle, as epitomized by oil-resource digging and greenhouse gas discharge. Continuous maintenance of this balance requires development of a common understanding in Asia and across the international community as a whole, rather than just in Japan. To this end, I hope that the practice of environmental communication, including the visualization of product environmental information, will provide an impetus for social undertakings aimed at addressing environmental issues.



Shigeru Suda

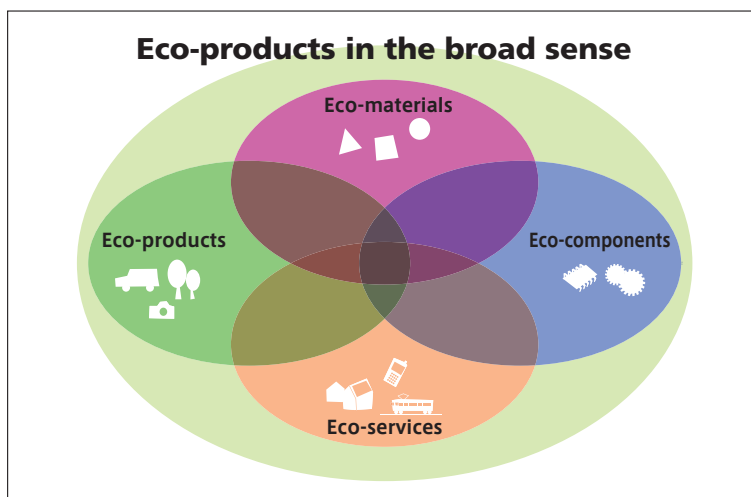
Director

Japan Environmental Management Association for Industry  
(JEMAI)

## Products listed in the *Eco-products Directory 2010*

### About eco-products

"Eco-products" generally refer to environmentally friendly products, but there is no strict definition. In the *Eco-products Directory 2010*, eco-products are defined as "products and services that comply with environmental regulations or are environment-friendly, reflecting manufacturers' voluntary efforts to care for the environment." Eco-products include not only industrial products but also products and services in the areas of agriculture, tourism, and finance. They also include products and services aimed directly at environmental impact reduction (i.e., eco-businesses, such as the production of pollution control devices, waste disposal/recycling, and consulting). In the *Eco-products Directory 2010*, eco-products are classified into four categories: materials, components, products, and services.



### Eco-products listed in this Directory

Many eco-products come with environmental labels that state product features to inform and appeal to consumers. They certify that items are eco-products according to standards independently set by countries, regions, organizations, and providers.

The International Organization for Standardization (ISO) classifies environmental labels into Type I, Type II, and Type III and environmental labels are then given based on compliance certification, producers' self-declaration of commitment to environmental preservation, and the verification and disclosure of quantitative environmental impact data. Additional environmental labels are awarded under standards and criteria of other bodies.

In addition to environmental labels, other initiatives are intended to raise consumers' environmental awareness, including the creation of databases where self-assessed products may be registered. Those initiatives are individual ones and thus differ.

## ISO environmental labels

**Type I** (ISO14020, ISO14024): Seal of approval-compliance approval

Description: Type I labels are managed in accordance with the standards and principles of the ISO. This system ensures that the use of the label is accepted by a third party based on an independent, multifaceted standard. The standard covers the entire product life (resource extraction, manufacturing, distribution, use, disposal, recycling). The submitted products are assessed for approval and if successful are awarded the Type I label.

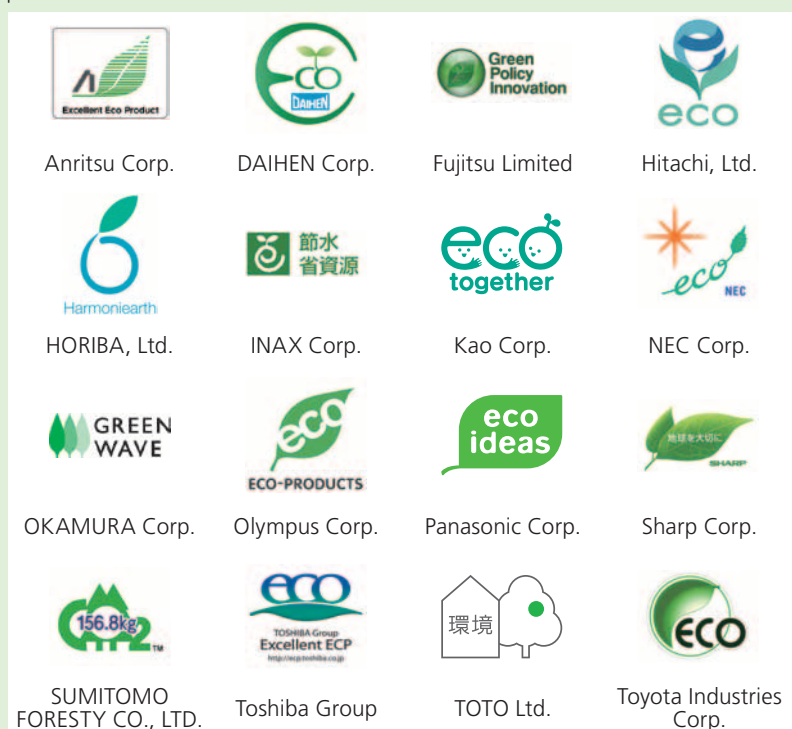
Examples:



**Type II** (ISO14021): Single attribute-producers' self-declaration of commitment to the environment

Description: Product providers independently incorporate environment-related improvements in their products. There is no intervention by any third party.

Examples:



### Type III (ISO14025): Report card-verification and disclosure of quantitative environmental impact data

Description: Type III labels are managed in accordance with ISO14025 (environmental declarations). They use the life cycle assessment (LCA) method to show environmental information on products quantitatively from resource extraction to manufacturing/assembly, distribution, use, and discarding/recycling. Only the reliability of disclosed data is verified and product evaluation is left to consumers.

Examples:



Eco Leaf  
(Japan)



EDP (Republic of  
Korea)



EPD  
(Sweden)

### Other environmental labels

There are other environmental labels apart from those of the ISO. Various environmental labels have been created in many areas including the consumer electronics industry and automotive industry.



Biomass Mark



Butterfly mark



Certificate of  
Environmental  
Building Material



Energy star  
labels



Energy-Saving  
Label



Fuel economy  
sticker



Green Energy  
Mark



GreenPla



J-Moss green  
marks



Low emitter vehicle  
sticker



NET



PEFC Forest  
Certification



PET bottle reclaimed  
product



TCO Development



Thinned Wood  
Mark



Uniform Energy-  
Saving Label



### Other initiatives to raise environmental awareness

Apart from the promotion of environmental labels, the Green Purchasing Network (GPN) in Japan formulated guidelines for purchasing environment-friendly products, together with important points to consider, in 17 categories including printing and communication paper, stationery and office products, and vehicles. In line with the guidelines, the GPN Database provides the public with environmental information on products. The information contained in the database is based on judgment by registrants, and in no way represents endorsement by the GPN for the products listed. The database is intended to catalogue products that comply with the GPN's Purchasing Guidelines and the Law on Promoting Green Purchasing and to provide environmental data on these products to enable comparisons by consumers making purchasing decisions.



Registered in  
the GPN Database

The products listed in the *Eco-products Directory 2010* are considered to be eco-products if any of the above-mentioned environmental labels have been received or declared, or if they are registered in the GPN Database. For listed products that have not received environmental labels or been registered in the GPN Database, the Eco-products Directory 2010 Working Group decided whether to include them based on related environmental performance information submitted by their producers. Please note that decisions by the Working Group are based solely on the environmental performance of products; listing in the Directory is in no way intended to represent a guarantee of their functions and safety.

# Properties of listed products and services during 2004-2010

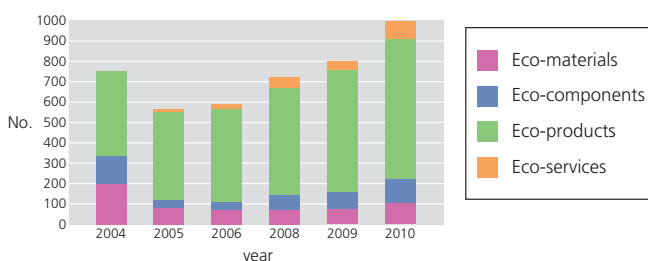
## 1. Number of eco-products and -services

- 1) The number of listed eco-products has been steadily increasing since 2004.
- 2) Listed eco-products account for nearly 70% of the total in 2010.
- 3) In 2010, the number of eco-services has doubled in one year.

\*Data entry for eco-services started in 2005.

	2004	2005	2006	2008	2009	2010
Eco-materials	199	80	71	70	73	105
Eco-components	134	39	39	73	83	131
Eco-products	421	432	453	526	604	670
Eco-services		16	28	56	44	94
Total	754	567	591	725	804	1,000

Figure 1. Number of listed products and services



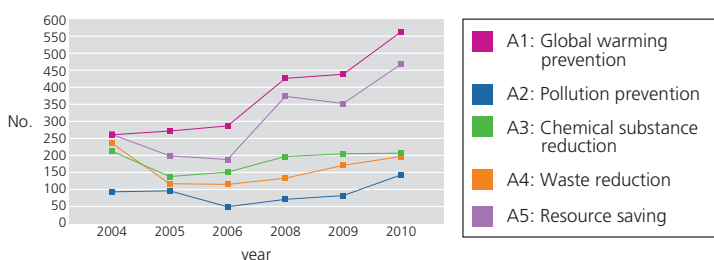
## 2. Number of products and services by category

Which environmental issues are eco-products intended to address?

- 1) More than 550 are categorized as effective in preventing global warming in 2010.
- 2) Category A products and services are divided into two subgroups. The first subgroup comprises Categories A1 and A5 which have the highest percentage gain in number of entries. The second subgroup comprises Categories A2, A3, and A4 which continue to have few entries.

	2004	2005	2006	2008	2009	2010
A1: Global warming prevention	263	274	289	429	441	566
A2: Pollution prevention	95	98	51	73	84	145
A3: Chemical substance reduction	215	140	153	199	207	209
A4: Waste reduction	238	119	117	135	173	199
A5: Resource saving	264	201	190	376	355	471

Figure 2. Number of products and services categorized as A1-5



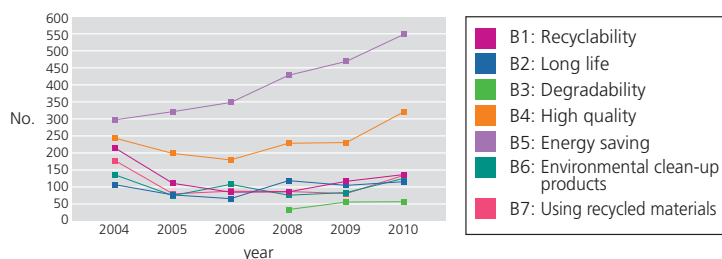
### How do eco-products address environmental issues?

- 1) Products categorized as energy saving increased from about 300 to 550 from 2004 to 2010.
- 2) Products categorized as using recycled materials increased from about 80 to 130 from 2009 to 2010.

\*Category B3 was newly added from 2008.

	2004	2005	2006	2008	2009	2010
B1: Recyclability	214	110	84	85	116	136
B2: Long life	106	76	65	118	104	115
B3: Degradability				33	55	56
B4: High quality	243	198	179	228	230	321
B5: Energy saving	297	321	348	428	469	549
B6: Environmental clean-up products	135	74	107	75	83	125
B7: Using recycled materials	177	79	87	86	80	134

Figure 3. Number of products and services categorized as B1-7

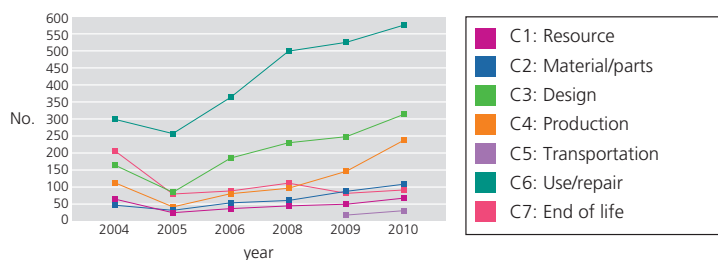


### When and where in the product life-cycle do eco-products address environmental issues?

- 1) Except for Category C7, the number of goods and services has gradually increased from 2005.
- 2) Products categorized as design increased from about 250 to 310 from 2009 to 2010.
- 3) Products categorized as production increased from about 150 to 240 from 2009 to 2010.

	2004	2005	2006	2008	2009	2010
C1: Resource	63	23	35	43	48	66
C2: Material/parts	45	30	52	59	86	107
C3: Design	163	83	184	229	247	313
C4: Production	111	40	79	95	145	237
C5: Transportation					16	29
C6: Use/repair	298	256	363	499	525	576
C7: End of life	205	78	87	110	80	90

Figure 4. Number of products and services categorized as C1-7



To ensure an accurate understanding of eco-products, the following three categories were developed for the Eco-products Directory 2010:

*Which*

## A: Which environmental issues are eco-products intended to address?

This category helps consumers understand which environmental issues eco-products are intended to address. The focus is on global warming and resource consumption. Issues related to pollution and contamination (air, water, and soil), which are serious problems in developing economies, and waste disposal, one of the weighty environmental problems in Japan, are also included. A total of five issues are therefore listed:



### Global warming prevention

Helps reduce emissions of greenhouse gases such as carbon dioxide. This initiative includes the direct reduction of greenhouse gas emissions as well as energy saving and the reduction of deforestation.



### Air/water/soil pollution prevention

Helps reduce emissions of substances contained in the air, water, and soil, such as photochemical oxidants (e.g., nitrogen oxides) and suspended particulate matter (e.g., sulfur oxides), which are substances restricted by environmental standards including air pollution control laws. This includes products that contribute to preventing ozone depletion and product oxidization. The clean-up of air/water/soil pollutants is also included.



### Chemical substance reduction

Helps reduce and clean up eco-toxic chemical substances harmful to humans and the environment. These chemicals include substances specified by laws that identify the environmental impact created by emissions of specific chemical substances and that promote better management of such substances. This includes the reduction and purification of hazardous substances by recycling and reuse as well as products containing low levels of or no hazardous substances.



### Waste reduction

Helps reduce the final disposal volumes by changing products, manufacturing processes, and packaging. This includes waste weight/volume reduction within the circulation system.



### Resource saving

Helps reduce the consumption of resources, such as mineral, forest, and water resources. This includes resource saving by reuse and recycling as well as resource saving in products and the manufacturing process.

# How

### B: How do eco-products address environmental issues?

This category explains how eco-products support environmental impact reduction in response to the five issues listed in A. The category is subdivided to provide comprehensive support for various environmental measures widely exercised at present. This clarifies whether resource saving is achieved through enhanced product performance, longer product life, or improved product recyclability.



#### **Recyclability/reusability/refillability**

Raw materials can be recovered, processed, and recycled for reuse. Alternatively, they can be recycled efficiently by using designs that are easily disassembled. Reusable and refillable designs may be used in packaging and products.



#### **Long life**

With long-life designs, enhanced durability, and continued performance with repairs and maintenance, product life can be prolonged, leading to the reduction of raw materials and waste.



#### **Degradability/compostability**

Products, packaging, and their components are biodegradable and produce substances that are relatively homogeneous and stable. They can also be degraded to a degree under certain conditions within a predetermined period of time.



#### **High quality/performance**

Product quality and performance improvements enable environmental impact reduction, subsequently leading to material and waste reduction.



#### **Energy saving**

Efficient process designs and product weight reduction enable energy saving. This initiative includes the use of energy recovered instead of disposal.



#### **Environmental clean-up products**

The use of hazardous chemical substances in product manufacturing is reduced through the development of alternative materials, etc.; or the use of the product helps clean up hazardous substances.



#### **Using recycled materials**

Recyclable materials (pre- and postconsumer) are recovered and recycled materials are used in the manufacturing process, either entirely or in high volumes.

# When Where

## C: When and where in the product life cycle do eco-products address environmental issues?

This category helps determine when and where within the life cycle environmental initiatives are reflected in eco-products. The product life cycle is broken down into seven steps: material extraction, material and component production, design, manufacturing, transportation, product use, and disposal.



### Extraction of materials (resources)

In this step, resources needed for product manufacturing are collected. Some equipment is used for environmental impact reduction in this stage.



### Material and component production (materials/parts)

This is a stage where interim products including materials and components are manufactured. Such interim products and their designs are intended for environmental impact reduction.



### Design and material selection (design)

In this step, designs and materials are carefully selected for product manufacturing, including environmentally compatible designs.



### Product manufacturing (production)

Products are manufactured in this step using materials and components. This step includes products that help reduce environmental impact during the manufacturing process.



### Transportation

In this step, materials, parts, and products are carefully transported to result in a low environmental burden. This step includes products for which modes of transportation have been changed and those with unique packaging.



### Product use, maintenance, and repair (use/repair)

In this step, products are used by consumers and maintenance and repairs are carried out. This step includes consideration of energy saving and environmental clean-up as well as for prolonging product life by repairs and product life improvement.

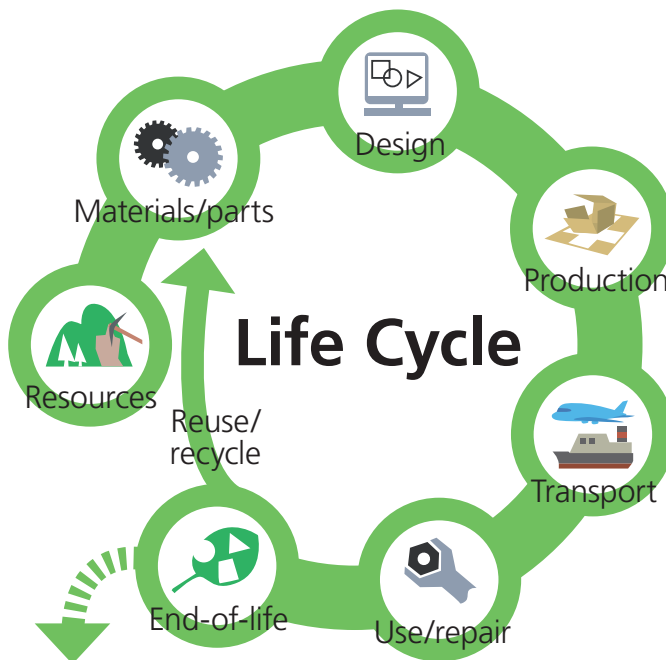


### End-of-life

In this step, products are disposed of and recycled. Included in this step are products that contribute to the reduction of final disposal volumes and can be disassembled, are easily reusable, easily recyclable, and compatible with well-established recycling systems.

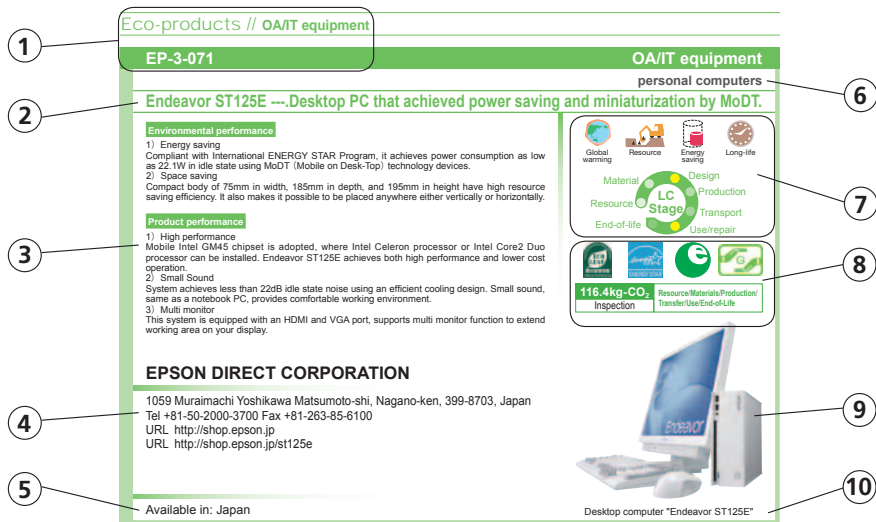
Each product listed in the *Eco-products Directory 2010* is categorized by a maximum of two items in categories A, B, and C.

Product life cycle stage: Schematic diagram



# Products data display in the *Eco-products Directory 2010*

The *Eco-products Directory 2010* is intended to enlighten people, mainly in the Asia-Pacific region, on eco-products and -services available. As many as possible are listed in this directory. To make it simple and easy for all environment-minded individuals to understand, the product data are sorted and arranged in the directory as shown below. We thank the providers for information on the products and services listed.



- |   |   |
|---|---|
| ① Product ID number   | ⑥ Common product name                               |
| ② Title (product name and features)                                       | ⑦ Categories  |
| ③ Product description (environmental performance and product performance) | ⑧ Environmental labels and greenhouse gas emissions |
| ④ Company information   | ⑨ Product photo                                     |
| ⑤ Sales territory   | ⑩ Photo caption                                     |

## ① Product ID number

All product ID numbers are displayed as shown below:

# EP-3-071

Classification1 Classification2 product item no.

## (1) Classification1

In the *Eco-products Directory 2010*, the information on each eco-product is provided in four categories: 1. Materials, 2. Components, 3. Products, and 4. Services. The product data also use frames of different colors for different main entries (1. pink, 2. blue, 3. green, and 4. orange).

Eco-materials	Eco-components
Eco-products	Eco-services



## (2) Classification<sup>2</sup>

Each main entry is divided into subentries as shown below:

### EM

- 1 Metals
- 2 Polymers
- 3 Natural materials
- 4 Foam
- 5 Ceramics and glass
- 6 Composites
- 7 Others

### EC

- 1 Construction components
- 2 Electrical and electronic components
- 3 Semiconductor-related devices and components
- 4 Machine parts
- 5 Automobile parts
- 6 Packaging
- 7 Others

### EP

- 1 Home electric appliances/lighting
- 2 Carriers/automobiles
- 3 OA/IT equipment
- 4 Office supplies/furniture
- 5 Apparel/textiles
- 6 Household goods and equipment
- 7 Building and civil engineering
- 8 Machines and equipment
- 9 Others

### ES

- 1 Product-related services  
(maintenance, upgrading, repair/reform)
- 2 Reuse and recycling services  
(collection, etc.)
- 3 Outsourcing services  
(waste disposal, control of hazardous items, chemical treatment, facility management)
- 4 Management-related services  
(consulting, accreditation, analysis, evaluation, etc.)
- 5 Others  
(e-commerce, eco-tourism, hotels, information transfer, etc.)

These subentries are shown the right side of the line for product ID numbers as follows:

Eco-materials // Metals

EM-1-001

Metals

Eco-components // Construction components

EC-1-001

Construction

Eco-products // Home electric appliances/lighting

EP-1-001

Home electric appliances/lighting

Eco-services // Product-related services (maintenance, upgrading, repair/reform)

ES-1-001

Product-related



---

### **(3) Product item number**

Each subentry lists product items in numerical order in accordance with the Japan Statistical Standard Industry Classification, the Standard Industrial Classification for Japan and the Commodity Classification for Census of Manufactures for Japan.

### **② Title (product name and features)**

Brief descriptions of how products have been improved to contribute to environmental impact reduction are provided in this section.

### **③ Product description (environmental performance and product performance)**

Detailed descriptions of how products have been improved to contribute to environmental impact reduction are provided in this section.

### **④ Company information**

The contact details of product providers are listed in this section including respective URLs for the Websites of providers, the listed product and provider's CSR report.

### **⑤ Sales territory**

Where each product is available can be found in this section.  
(Sales territories are not always stated, as this is a free-listing section.)

### **⑥ Common product name**

The common name of each product is given in this section  
(e.g., camera, pencil, desk, etc.).

### **⑦ Categories**

How eco-products reflect certain environmental initiatives is indicated graphically under the following three categories:

**A: Which environmental issues are eco-products intended to address?**

**B: How do eco-products address environmental issues?**

**C: When and where in the product life cycle do eco-products address environmental issues?**

The icons indicate items (maximum of two each) selected from Categories A (which) and B (how).

### <icons>

#### A: "Which"



Global warming



Air/Water/Soil



Chemical substances



Waste



Resource

#### B: "How"



Recyclable



Long-life



Degradable



High quality



Energy saving



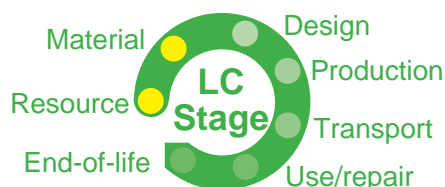
Purification



Recycled materials

The yellow dots indicate items (maximum of two) selected from

#### C: "When" and "Where"



### ⑧ Environmental labels and greenhouse gas emissions

Up to four eco-labels granted to products are displayed based on applications from providers. For information on the types and names of these eco-labels, please refer to page 6-9 in 3. Products listed in the *Eco-products Directory 2010*.

As a new development, we asked providers to specify greenhouse gas (GHG) emissions per product (if available) and indicate respective CO<sub>2</sub> equivalents below the illustration of the environmental labels. Where such values are indicated, we also specify the scope of the life cycle stages included in the calculation of GHG emissions (i.e., resource extraction, production of materials/parts, product manufacturing, transportation, use, and disposal). As a further measure, we indicate whether such values were inspected by a third-party organization.

### ⑨ Product photo

One photo is inserted for each product.

### ⑩ Photo caption

The caption provides a brief description, e.g., model name, of each product photo.

# Eco-materials

- 1 Metals**
- 2 Polymers**
- 3 Natural materials**
- 4 Foam**
- 5 Ceramics and glass**
- 6 Composites**
- 7 Others**

In the *Eco-products Directory 2010*, “eco-materials” refer to “materials (or material technologies) that possess excellent characteristics with good performance, which can be manufactured, used, and recycled or disposed of, while having only a low impact on the environment as well as being kind to humans.” Environment-friendly eco-materials come in a diverse range and include recyclable materials, materials free from hazardous substances, materials manufactured with low energy consumption and in clean conditions, materials that purify contaminated water and air, materials that are very efficient and resource-saving while still offering high performance, and much more.

Carefully assessing the impact on the environment within its life cycle from resource collection to the disposal stage is important in choosing eco-materials. Once this has been clarified, eco-materials can be used to create eco-products with a good balance between function and eco-efficiency. Based on this concept, eco-materials must meet the following six criteria:

- (1) They do not use scarce resources.
- (2) They have functions to clean and conserve the environment.
- (3) They create only low environmental impact when manufactured.
- (4) They do not contain any hazardous substances.
- (5) They provide high performance when used.
- (6) They are easy to recycle.



## EM-1-001

## Metals

## VCEM brand, ground granulated blast furnace slag (GGBS)

## Environmental performance

GGBS's raw material is a by-product of the iron-making industry derived from iron blast furnaces. The manufacture of GGBS reduces landfill problems and cuts gas emissions at steel plants. Every ton of GGBS reduces almost 1 ton of CO<sub>2</sub> by replacing Ordinary Portland Cement (OPC), a material normally used in concrete. Every ton of GGBS produced consumes only 10% of the energy required to produce 1 ton of OPC.

## Product performance

Using GGBS in concrete improves workability, high compressive and flexural strengths, and resistance to damaging / aggressive chemicals. GGBS lowers permeability in concrete, therefore reducing the potential for reinforcing steel to corrode when exposed to chlorides. GGBS reduces the risk of thermal cracking in large concrete pours. GGBS's off-white color reduces the "urban heat island" effect by making lighter-color concrete, enabling it to reflect more light and cooling structures and pavements with exposed concrete.

## EnGro Corporation Ltd.

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E-mail [vincent.loh@engro-global.com](mailto:vincent.loh@engro-global.com)  
URL [www.engro-global.com](http://www.engro-global.com)  
URL [www.vcem-global.com](http://www.vcem-global.com)

## granulated blast furnace slag



70kg-CO <sub>2</sub>	Resource/Materials/Production/Transfer/Use/End-of-Life
Inspection	



**VCEM**  
BUILDING DURABILITY  
Green Label ID No.022 003  
ECO-FRIENDLY  
BUILDING MATERIAL



## EM-1-002

## Metals

## shape steel

## Smart Beam™ lightweight welded H-beam

## Environmental performance

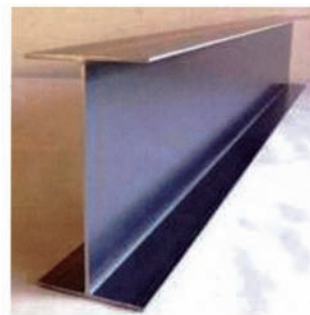
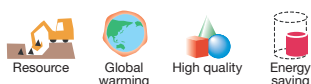
Sumitomo Metals is developing technologies that will allow the Smart Beam™ H-beam, which is produced continuously by welding of a hot-rolled coil, to be used for a range of applications. It is 20-30% lighter than a conventional rolled H-beam with the same performance, and is being used in industrialized home-building and other construction.

## Product performance

Reducing the weight of construction materials is an important issue not only for cutting costs, but also for helping conserve natural resources. It can also be used as beams in wooden houses in order to reduce warpage of the floor and improve durability.

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Smart BEAM™

Smart Beam

Available in: Worldwide

## EM-1-003

## Metals

## steel pipe materials

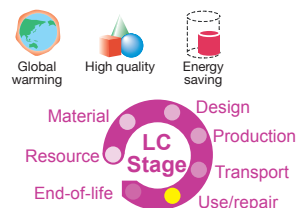
## X-80 large-diameter welded steel pipe for gas pipelines

## Environmental performance

This products is used for super-high pressure transportation natural gas pipe lines to boost transportation efficiency.

## Product performance

In addition to increasing the level of purity in order to improve corrosion resistance, we have used our original component design and heat treatment technologies to create the X80 large-diameter welded steel pipe which further improves the strength of pipelines. As a safe pipe that can prevent rupture in case of earthquakes, this product is helping to increase the use of natural gas.



Line pipe

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Available in: Worldwide

Line pipe

## EM-1-004

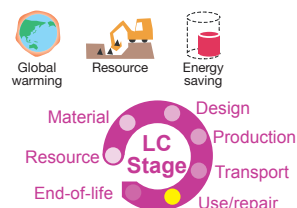
## Metals

## sheet steel

## High Tensile Steel

## Environmental performance

Demand for high tensile steel sheets (HITEN) is growing as a material that enables both automobile body weight reduction and collision safety. Recently, demand has increased for higher tensile strength steel sheets (Ultra HITEN). The cold rolled 1180MPa, created with our proprietary WQ (Water Quenching) continuous annealing process, was employed for integrally molded door impact beams made with conventional press forming.



Center pillar of 980 MPa grade HITEN steel sheet

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## EM-1-005

## Metals

sheet steel

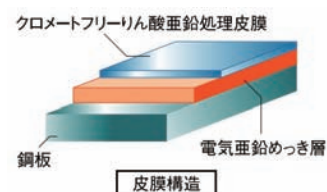
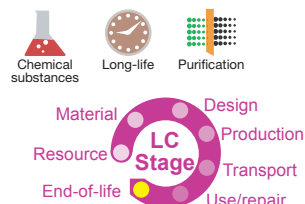
## Chromate-free coated steel sheet

## Environmental performance

Chromate-free coated steel sheet is an environment-friendly product, since it contains no chrome (VI). A uniquely designed composite film consisting of a special organic resin and inorganic substance secures as much corrosion resistance as conventional products. It is now used in internal panels of home electric appliances and vending machines, internal components of OA equipment, chassis of audiovisual equipment, and other parts.

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## EM-1-006

## Metals

sheet steel

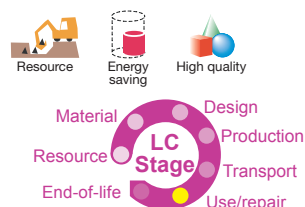
## all-purpose stainless steel JFE443CT

## Environmental performance

JFE443CT is all-purpose stainless steel which does not contain such rare resources as nickel or molybdenum but ensures high corrosion resistance equivalent to SUS304. When applied to cooking pans for induction heating (IH), it leads to substantial energy saving because of its properties of excellent heat transmission and magnetism.

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## EM-1-007

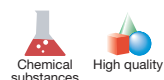
## Metals

sheet steel

## Highly Lubricant GA Steel Sheet: "JAZ"® (JFE Advanced Zinc) "

## Environmental performance

As an environment-friendly product, "JAZ"® does not contain phosphate or heavy metal elements which used to be contained in conventional lubricated GA steel sheets. In this unique product, a surface reforming layer with nano-level thickness is formed on a zinc coated layer. JAZ® has been adopted in automotive outer panels or inner panels which are otherwise difficult to form. More specifically, it is used in side panels, fenders, doors, and wheelhouses, etc.



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## EM-1-008

## Metals

sheet steel

## FCA-W steel plate, high-tensile-strength plate for improving the fatigue of welded joints

## Environmental performance

FCA-W steel plate achieved weight reductions through the development of the innovative high-tensile-strength, contributes to reducing CO<sub>2</sub> emission.

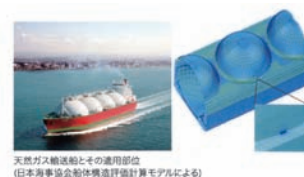
## Product performance

By using this product, which not only controls the propagation of fatigue cracks, but also prevents fatigue cracks from occurring at welded joints in the first place, designers get free from design steps such as increasing plate thickness or adding reinforcement materials were used to prevent fatigue fracture of welded joints in steel structures.



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Available in: Worldwide

Natural gas carrier ship and the parts where FCA-W is used

EM-1-009

Metals

sheet steel

**NAR-301L HS1 stainless steel plate for cylinder head gaskets****Environmental performance**

Sumitomo Metals (Naoetsu) has applied its original component design and manufacturing conditions to develop an ultra-fine structure steel plate with more than 30% better fatigue-resistance characteristics, contributing to technology aimed at reducing fuel consumption.

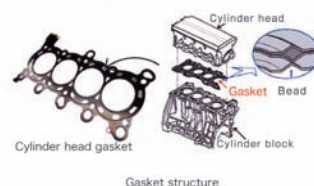
**Product performance**

The cylinder head gasket is a component that supports technology used to improve the combustion efficiency of an automobile engine and to improve fuel economy. It is important that this component have spring performance that can keep gaps closed while adapting to vibration and heat, as well as good fatigue-resistance characteristics. This product has been very highly evaluated, and is used in vehicles marketed by Honda Motor Co.

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Available in: Worldwide



Gasket structure

EM-1-010

Metals

sheet steel

**Non-oriented electromagnetic steel sheet for high-efficiency motors****Environmental performance**

This product is non-oriented electromagnetic steel sheet used in hybrid vehicle drive motors and air conditioner compressors, an iron core with superior magnetic characteristics is needed to achieve lighter weight, smaller size, and higher performance in the high-efficiency motors.

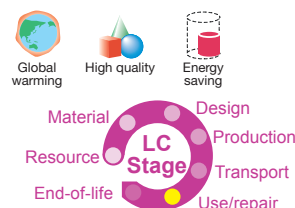
**Product performance**

We have applied its original component design and heat treatment technologies to control the crystal orientation and develop a non-oriented electromagnetic steel sheet with lower electrical loss and improved electromagnetic characteristics. This product has been praised as a revolutionary new technology from many directions.

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Available in: Worldwide



Non-oriented electromagnetic steel sheet for high-efficiency motors

Non-oriented electromagnetic steel sheet for high-efficiency motors

## EM-1-011

## Metals

## sheet steel

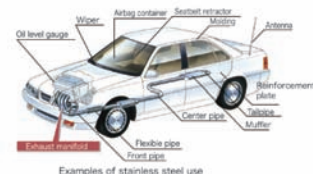
## NAR-AH-4 high heat-resistance stainless steel

## Environmental performance

NAR-AH-4 contributes to the conservation of resources by using less than half of the amount of the valuable resource nickel than conventional products. At the same time, this product retains the same or better high-temperature strength and high-temperature oxidation resistance.

## Product performance

This product is used in automobile exhaust manifolds and other applications.



Examples of stainless steel use

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Available in: Worldwide

Examples of stainless steel use

## EM-1-012

## Metals

## sheet steel

## Chrome-free thin steel sheet

## Environmental performance

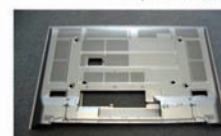
Previously chrome compounds were used for the surface treatment of steel sheet to prevent corrosion. Sumitomo Metals is developing surface-treated steel sheet that uses no chrome compounds at all, designed for specific applications.

## Product performance

Our products for use as motor covers are known for their excellent corrosion resistance, high resistance to surface peeling under harsh forming conditions, and the fact that they do not require cleaning with organic solvents-substances that have a large impact on the environment. For fuel tank applications, we are developing a material that can be used with highly corrosive bio-ethanol fuels.



Example of use (motor cover)



Example of use (back panel for plasma TV)

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Available in: Worldwide

Example of use (back panel for plasma TV)

## EM-1-013

## Metals

## sheet steel

## The New S-TEN1, high corrosion resistance steel material

## Environmental performance

Anti-corrosive properties to combat hydrochloric acid than conventional products.

## Product performance

Demand for steel material with outstanding anti-corrosive properties is growing rapidly, especially from waste incinerating facilities exposed to corrosive hydrochloric acid from food and plastic waste. Nippon Steel developed the new S-TEN1, with dramatically increased anti-corrosive properties to combat hydrochloric acid than conventional products. It has been on the market on a fully-fledged basis since 2003. The new S-TEN1's ability to resist hydrochloric acid is around three times higher than that of conventional products. This makes the new S-TEN1 an ideal material for use in waste processing and chemical plants. It also leads to extended product life and a reduced frequency in maintenance requirements to benefit users, as well as an overall reduction in environmental loads on a societal level.

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## EM-1-014

## Metals

## sheet steel

## HTUFF (Super High HAZ (heat-affected zone) Toughness)

## Environmental performance

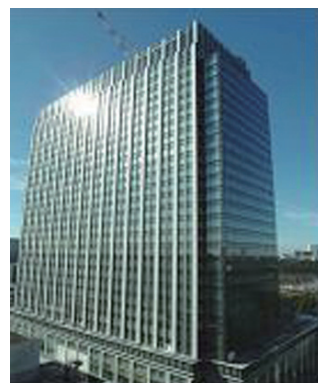
Welding efficiency should be ten times compared with the conventional way.

## Product performance

The steel plates for ships, buildings and other large structures are prone to coarsening when exposed to the heat required during the welding process. Previously, a construction technique of performing welding on a gradual basis was used to ensure safety and reliability, rather than completing the welding process in one step. Nippon Steel's HTUFF super-tough and super-strong steel sheet eliminated the needed for repeated welding, since Nippon Steel radically reduced the size of metal particles in the welding-induced heat-affected areas of the HTUFF steel sheet through nanotechnology. Such miniaturization suppresses the deterioration of HTUFF's toughness, even when exposed to extreme temperatures. The HTUFF steel sheet drastically improved the welding efficiency of users and contributed toward energy savings.

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## EM-1-015

## Metals

## sheet steel

## GA-TRIP hot-dip galvanized sheet boasts high tensile strength

## Environmental performance

Improving the collision safety of cars, vehicle weight and the balance between press formability and extended lifespan.

## Product performance

Nippon Steel was the first company worldwide to successfully develop and commercialize alloy hot-dipped galvanized steel sheets for automobiles with tensile strength in the 60 and 80 kilogram classes, by overcoming the conventional notion that high tensile would be impossible without compromising the quality of galvanization. The new product was selected as a material for new car models introduced in 2003. It greatly improves the collision safety of cars, vehicle weight and the balance between press formability and extended lifespan.



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 URL <http://www.nsc.co.jp/en/eco/index.html>

## EM-1-016

## Metals

## sheet steel

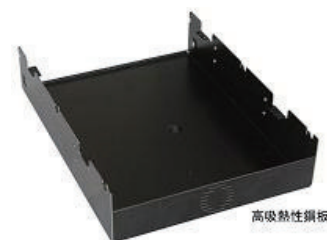
## High-endothermic steel sheet

## Environmental performance

High-endothermic steel sheets that release the heat generated inside electric appliances efficiently to the outside.

## Product performance

In view of the trend toward higher performance, higher speed, and smaller size, it has become important for electric appliances to release internally generated heat efficiently to the outside. Nippon Steel, after the successful development of special organic film in 2002, has started to distribute high-endothermic steel sheets that release the heat generated inside electric appliances efficiently to the outside.



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 URL <http://www.nsc.co.jp/en/eco/index.html>

## EM-1-017

## Metals

## sheet steel

## Flat rolled magnetic steel sheet/strip for high electrical efficiency

## Environmental performance

High-tensile thin electrical steel sheets for ultra high-speed motors etc that can increase 1% of motor efficiency.

## Product performance

Since motors are increasingly required to be highly efficient in terms of energy saving, thin high-efficiency electrical steel sheets have applications in a variety of fields, such as motors used for hard disc drive units, motors for electric vehicles, and power generators for microgas turbines. Nippon Steel developed high-tensile thin electrical steel sheets for ultra high-speed motors and high-torque, high-formability thin electrical steel sheets for hard disc drive units.



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 URL <http://www.nsc.co.jp/en/eco/index.html>



## EM-1-018

## Metals

## sheet steel

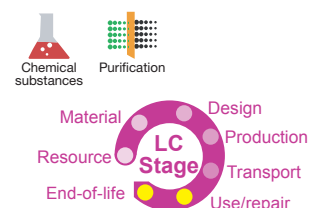
## Lead-free steel sheet for car fuel tank

## Environmental performance

Lead-free aluminum or tin-zinc coated steel sheet

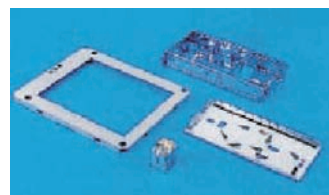
## Product performance

Conventionally, lead-coated steel sheets have been used for car fuel tanks. Nippon Steel is now supplying a newly developed lead-free aluminum or tin-zinc coated steel sheet (Silver Zinc-NT). This eliminates the problem of lead in shredder dust generated when cars are scrapped.



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 URL <http://www.nsc.co.jp/en/eco/index.html>





## EM-1-019

## Metals

## sheet steel

## Steel sheet coated with chromate-free film

## Environmental performance

An eco-friendly resin coating, free of chromic acid, that protects the surface zinc against oxidation.

## Product performance

Conventionally, galvanized steel sheets are used in the manufacture of home electrical appliances such as refrigerators, washing machines, and air conditioners to prevent rust. However, the sheets are coated with a film containing trace amounts of chromic acid to prevent the zinc from being oxidized. Nippon Steel developed an eco-friendly resin coating, free of chromic acid, that protects the surface zinc against oxidation.



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## EM-1-020

## Metals

## sheet steel

## ZINKOTE-BLACK

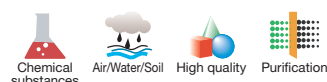
## Environmental performance

Newly-developed water-soluble coating material that permits low-temperature drying, the film thickness of ZINKOTE- BLACK's coating can be reduced by 70 to 80%, compared to that of conventional coated steel sheets.

Also a reduction in CO<sub>2</sub> emissions during manufacturing at Nippon Steel, fewer organic components occurring during drying of the coating material, compared to similar coated sheets, make it possible to reduce CO<sub>2</sub> emissions to 1/100.

## Product performance

ZINKOTE-BLACK is a new environmentally friendly product, using Nippon Steel's chromate-free electrogalvanized steel sheet, ZINKOTE21.



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Excellent formability

## EM-1-021

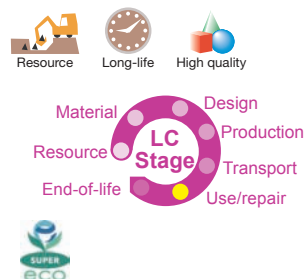
## Metals

mold steel

## Advanced Plastic Mold Steel For General Purposes, "HPM-MAGIC®"

## Environmental performance

Because "HPM-MAGIC®" has high toughness, breakage and chipping would be reduced, and we would expect longer die life. Furthermore, because of good machinability, we can expect longer tool life and shorter working time in mold processing. Therefore "HPM-MAGIC®" can provide opportunities to save resource and energy.



## Hitachi Metals, Ltd.

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 URL <http://www.hitachi-metals.co.jp/e/index.html>  
 URL [http://www.hitachi-metals.co.jp/e/prod/prod19/p19\\_10.html](http://www.hitachi-metals.co.jp/e/prod/prod19/p19_10.html)  
 URL [http://www.hitachi-metals.co.jp/e/corp/corp14\\_01.html](http://www.hitachi-metals.co.jp/e/corp/corp14_01.html)

Available in: Worldwide



## EM-1-022

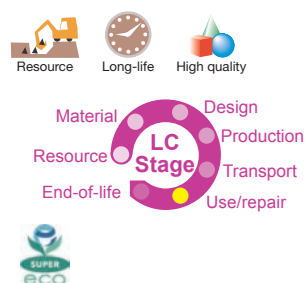
## Metals

mold steel

## High Performance Cold Working Tool Steel "SLD-MAGIC®"

## Environmental performance

SLD-MAGIC®, newly developed Cold Working Die Steel, is showing good reputation for wear resistance and machinability along with achieving excellent characteristics of lower heat treatment distortion, versatilities for surface treatments, toughness and weldability. "SLD-MAGIC®" can also improve the lifespan and fabricability of die molds compared to currently used die materials. Therefore, "SLD-MAGIC®" can provide opportunities to reduce energy material to be used and fabrication time for making various molds for automobile industries, and other industrial fields where molds are necessary.



## Hitachi Metals, Ltd.

SEAVANS North Building, 1-2-1, Shibaura, Minato-ku, Tokyo, 105-8614, Japan  
 Tel +81-3-5765-4410  
 E-mail [hmcc@hitachi-metals.co.jp](mailto:hmcc@hitachi-metals.co.jp)  
 URL <http://www.hitachi-metals.co.jp/e/index.html>  
 URL [http://www.hitachi-metals.co.jp/e/prod/prod19/p19\\_01.html](http://www.hitachi-metals.co.jp/e/prod/prod19/p19_01.html)  
 URL [http://www.hitachi-metals.co.jp/e/corp/corp14\\_01.html](http://www.hitachi-metals.co.jp/e/corp/corp14_01.html)

Available in: Worldwide





## EM-1-023

## Metals

## steel materials

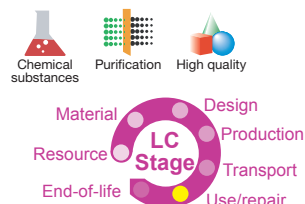
## Smigreen CS™ low carbon lead-free free-cutting steel

## Environmental performance

Previously, lead was used to improve the cutting performance of free-cutting steel. Smigreen CS™, low carbon steel that utilizes no lead at all thanks to an increase in the amount of sulfur compounds added, maintains good cutting machinability without including lead.

## Product performance

This product has been adopted for use as printer shafts by a major office automation (OA) equipment manufacturer.



## Sumitomo Metal Industries, Ltd.

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Tel +81-3-4416-6183 Fax +81-3-4416-6793  
E-mail [chikyu-kan@sumitomometals.co.jp](mailto:chikyu-kan@sumitomometals.co.jp)  
URL <http://www.sumitomometals.co.jp>



Example of use (printer shafts)

Available in: Worldwide

Example of use (printer shafts)

## EM-1-024

## Metals

## steel materials

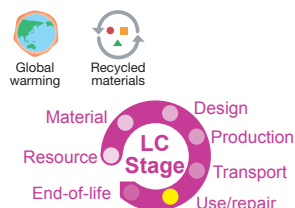
## Various steel products manufactured by using electric arc furnace

## Environmental performance

Comparing two methods, there is a big difference in the CO<sub>2</sub> emissions, namely making one ton of steel through a blast furnace method emits 2 tons of CO<sub>2</sub> but only 0.5 tons by an electric arc furnace method. That means, if we produce the same kind of steel, the CO<sub>2</sub> emissions from an electric arc furnace mill are one fourth of a blast furnace mill. Our efforts to further promote recycling of steel scraps will result in more reduction of CO<sub>2</sub> and consequently contribute to prevent global warming.

## Product performance

Tokyo Steel offers high-quality, low-cost products having been realized through its aggressive investments into state-of-the-art technologies and its consistent efforts to improve quality control. In addition to the various long steel products, Tokyo Steel now also offers a full complement of flat steel products in order to meet the wider and more diversified needs of its customers in both Japan and overseas.



Hot rolled coils

## Tokyo Steel Manufacturing Co., LTD.

Daidoseimei Kasumigaseki Bldg. 1-4-2 kasumigaseki, Chiyodaku, Tokyo, 100-0013, Japan  
Tel +81-3-3501-7721 Fax +81-3-3580-8837  
E-mail [tokyo@tokyosteel.co.jp](mailto:tokyo@tokyosteel.co.jp)  
URL <http://www.tokyosteel.co.jp>  
URL <http://www.tokyosteel.co.jp/products.html>  
URL <http://www.tokyosteel.co.jp/pdf/sp.pdf>

## EM-1-025

## Metals

## steel materials

## Lead-free free-cutting steel (steel bars)

## Environmental performance

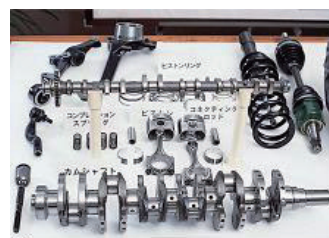
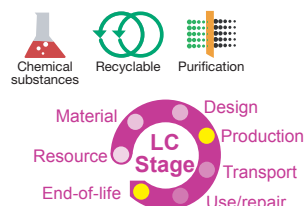
Free-cutting steel products without the environmentally negative material "lead".

## Product performance

The shapes of crankshafts used in automobiles, among others, are very complicated. Manufacturers demand superior free-cutting capabilities in steel to guarantee ease of manufacturability in machine processing. They have other rigid requirements, including its effect on the life of tools, and demand that the materials they purchase address all aspects of manufacturing comprehensively. In order to meet their needs, Nippon Steel came up with free-cutting steel products free of environmentally negative lead. A range of products to meet the needs of automakers has been developed and offered by Nippon Steel.

## Nippon Steel Corporation

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Tel +81-3-6867-2566 Fax +81-3-6867-4999  
E-mail [kankyo@nsc.co.jp](mailto:kankyo@nsc.co.jp)  
URL <http://www.nsc.co.jp/en/eco/index.html>



## EM-1-026

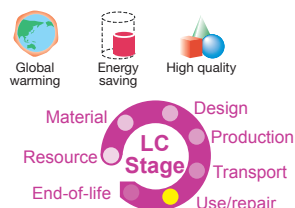
## Metals

## steel pipes

## Automotive Steel Tubes

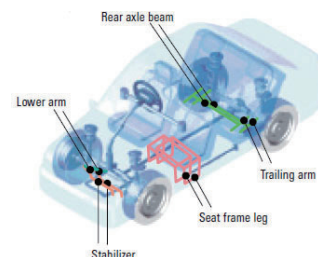
## Environmental performance

High performance electric resistance welded steel tubes known as "HISTORY (high speed tube welding and optimum reducing technology) steel tubes" contribute to automotive weight reduction by realizing hollow tubes and properties of high strength and high formability.



## JFE Steel Corporation

2-3, Uchisaiwai-cho 2-chome, Chiyoda-ku, Tokyo, 100-0011, Japan  
Tel +81-3-3597-3111 Fax +81-3-3597-4860  
URL <http://www.jfe-steel.co.jp/>



## EM-1-027

## Metals

## steel pipes

## SM125S super high-strength corrosion-resistant steel OCTG (oil country tubular goods)

## Environmental performance

SM125S are steel tubes with high strength and high corrosion resistance to extract natural gas, much of it exists in environments at great depths where highly corrosive hydrogen sulfide is present.

## Product performance

SM125S create high strength (125 ksi) and high corrosion-resistant by applying a technology that envelops impurities in the steel with another impurity. This has made possible the previously impossible development of gas wells at depths of 4,000-6,000 meters or more.



Global warming



High quality



Natural gas development projects made possible by this product

## Sumitomo Metal Industries, Ltd.

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URL <http://www.sumitomometals.co.jp>

Available in: Worldwide

Natural gas development projects made possible by this product

## EM-1-028

## Metals

## steel pipes

## Stainless steel boiler tubes for ultra supercritical coal-fired thermal power generation

## Environmental performance

At coal-fired power plants, improving power-generating efficiency by increasing the temperature and pressure (to the ultra supercritical state) of the steam generated by the boiler is a key issue for saving energy and reducing CO<sub>2</sub> emissions. By applying stainless steel boiler tubes for ultra supercritical coal-fired thermal power generation, the efficiency improved by 2% (up to 43%), CO<sub>2</sub> emissions decreased by 5% compared with conventional condition (supercritical state).

## Product performance

This product has the excellent high-temperature strength, and high resistance to steam oxidation corrosion and high-temperature corrosion, that are needed for use in ultra supercritical applications. We developed the world's strongest 18% chrome steel for use as steel tubes, by working with 18% chrome steel and applying technology for creating smaller crystal grain using niobium (Nb) carbide, and by also applying copper supplementation. For use with high sulfur-content coal, we have also developed the world's first 25% chrome steel for use as boiler tubes.



Global warming



High quality



Energy saving



Boiler tubes

## Sumitomo Metal Industries, Ltd.

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E-mail [chikyu-kan@sumitomometals.co.jp](mailto:chikyu-kan@sumitomometals.co.jp)  
URL <http://www.sumitomometals.co.jp>

Available in: Worldwide

boiler tubes

## EM-1-029

## Metals

## steel pipes

## Steam generator heat transfer (SG) tubes for new-model furnaces at nuclear power plants

## Environmental performance

The SG tubes used in nuclear power plants contribute to reductions in CO<sub>2</sub> emissions. We are investing in increased production capacity for the SG tubes, helping to increase the global supply of electricity and reduce CO<sub>2</sub> emissions.

## Product performance

The SG tubes used in nuclear power plants must be of high quality and are difficult to manufacture. The Sumitomo Metals SG tubes utilize an original manufacturing process known as "high-pressure drawing," which is characterized by its extremely small level of dimensional variation. This makes it possible to perform high-sensitivity detection of microscopic defects, allowing early detection of deterioration during use and yielding a high level of reliability. These SG tubes were first used in the AP1000, a new-model reactor designed by the U.S. company Westinghouse for improved safety and economic efficiency.

## Sumitomo Metal Industries, Ltd.

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URL <http://www.sumitomometals.co.jp>

Available in: Worldwide



Global warming



High quality



Steam generator heat transfer (SG) tubes

Steam generator heat transfer (SG) tubes

## EM-1-030

## Metals

## construction method

## Construction method using thin-sheet steel

## Environmental performance

Using galvanized thin-sheet steel for the frame of two-by-four system buildings can reduce the electric power for air conditioning. Approximately 4tons of CO<sub>2</sub> can be saved.

## Product performance

Nippon Steel Corporation developed a new construction method called "Nittetsu super frame" using thin-sheet steel for low rise residential buildings. Offering extra durability, it involves the use of galvanized thin-sheet steel for the frame of wooden buildings constructed using the two-by-four system. The method involves adiabatic construction which involves packing the outside walls of the building with heat insulator. This provides more efficient heating and air-conditioning and saves energy. In addition, the use of recyclable steel products helps to conserve forest resources.

## Nippon Steel Corporation

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Tel +81-3-6867-2566 Fax +81-3-6867-4999  
E-mail [kankyo@nsc.co.jp](mailto:kankyo@nsc.co.jp)  
URL <http://www.nsc.co.jp/en/eco/index.html>



Global warming



Waste



Long-life



EM-1-031

Metals

copper alloy

## ECO BRASS ( High-Performance Lead-free Copper Alloy )

## Environmental performance

ECO BRASS is a lead-free brass and environmentally friendly brass material. Instead of using heavy metal harmful to the human body, a precipitating metallic compound in the metal structure realizes good machinability.

Key Features:

- 1) Lead-free
- 2) High strength equivalent to stainless steel
- 3) Good machinability nearly equal to brass rod containing 1% lead
- 4) Excellent machined surface, de-zincification corrosion resistance, stress corrosion cracking resistance, warm brittleness cracking resistance, and hot forgeability
- 5) Easily accepts soldering and brazing
- 6) Good castability

Applications:

- 1) Water supply devices such as faucets, valves, fittings, etc.
- 2) Precision parts as a substitute for stainless steel such as shafts, screws, bearings
- 3) Electrical parts and connectors
- 4) Automobile parts: lead-free requirements
- 5) Medical devices

## Mitsubishi Shindoh Co., LTD

374, 8-cho, Sambo-cho, Sakai-ku, Sakai-shi, Osaka, 590-0906, Japan

Tel +81-72-233-1161 Fax +81-72-227-6590

URL <http://www.mitsubishi-shindoh.com/global/index.html>

URL <http://www.ecobrass.com/>



Available in: Except Europe, North America

Machined products using ECO BRASS rods

EM-1-032

Metals

alloy material

## Pure titanium sheet for aircraft Titanium alloy rods for aircraft engines

## Environmental performance

Titanium is being increasingly used in larger aircraft as a means of reducing weight in order to lower CO<sub>2</sub> emissions and reduce noise.

## Product performance

Sumitomo Metals (Naoetsu) has been highly praised for its advanced quality management and delivery management, and is the exclusive supplier to Airbus of the pure titanium sheet used in the pylons that connect the wings and engines and in the piping. In addition, the titanium alloy rods produced by Sumitomo Metals were the first such Japanese products to be certified by Rolls Royce, and will be used in aircraft engine wing components and other parts. The titanium products of the Sumitomo Metals Group have been certified by Nadcap, the global aerospace standard inspection and certification program, and are approved for use by the airline industry around the world.

## Sumitomo Metal Industries, Ltd.

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Tel +81-3-4416-6183 Fax +81-3-4416-6793

E-mail [chikyu-kan@sumitomometals.co.jp](mailto:chikyu-kan@sumitomometals.co.jp)

URL <http://www.sumitomometals.co.jp>



Airbus A380

Available in: Worldwide

Airbus A380

EM-1-033

Metals

coated aluminum metal

Chromium-free new surface treatment technique

Environmental performance

Chromium-free new surface treatment technique ("Super-Ecoat"<sup>TM</sup>) is an environment-friendly surface treatment for aluminum, since it contains no chromium and other poisonous substance.

Product performance

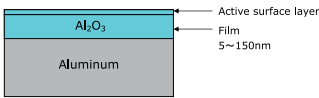
In this newly developed surface treatment product, non-porous, dense and thin aluminum oxide film with active surface layer is formed on aluminum. Corrosion resistance, adhesion and bonding strength more than equal to that of conventional chromate treatment are obtained. It is now widely used in home electric appliances, electronic parts, beverage and food containers, etc.

Mitsubishi Aluminum Co., Ltd.

2-3-3.Shiba, Minato-ku, Tokyo, 105-8546, Japan  
Tel +81-3-3769-0111 Fax +81-3-3769-0180  
URL <http://www.malco.co.jp/english/index.html>



- 【Feature and film composition of Super-Ecoat】
- ① Aluminum oxide film (high safety)
  - ② Non-porous and dense film (corrosion resistance)
  - ③ Chemical bond by active surface layer (Adhesion and bonding strength)
  - ④ It forms with anodic oxidation treatment (High-speed processing and uniformity)



Super-Ecoat



EM-2-001

Polymers

biodegradable resin

GCS-PLA GC8400 (Pellet)

Environmental performance

1. These biodegradable products contribute to reduced environmental problems caused by conventional plastic wastes.
2. These biodegradable products are stable in the atmosphere but they are decomposed by living microorganisms in compost, wet soil, and the sea.
3. These biodegradable products can be recycled several times in most conventional plastic processing equipment.

Product performance

GCS-PLA (GC8400) is used for biodegradable compost bags, shopping bags, etc. The base materials are AP (PLA) + starch

Green Chemical Co., Ltd

17-3, Yangpyeong-Ri, Moga-Myeon, Icheon-Si, Kyunggi-Do, 467-873,  
Republic of Korea  
Tel +82-31-632-9152 Fax +82-31-632-9153  
E-mail gcspla@yahoo.co.kr  
URL www.gcspla.co.kr

Available in: Worldwide



Application use: Biodegradable shopping bags

EM-2-002

Polymers

biodegradable resin

GCS-PLA GC8000 (Pellet)

Environmental performance

1. These biodegradable products contribute to reduced environmental problems caused by conventional plastic wastes.
2. These biodegradable products are stable in the atmosphere but they are decomposed by living microorganisms in compost, wet soil, and the sea.
3. These biodegradable products can be recycled several times in most conventional plastic processing equipment.

Product performance

GCS-PLA GC8000 is used for biodegradable garbage bags, compost bags, shopping bags, etc.

Green Chemical Co., Ltd

17-3, Yangpyeong-Ri, Moga-Myeon, Icheon-City, Kyunggi-Do, 467-873,  
Republic of Korea  
Tel +82-31-632-9152 Fax +82-31-632-9152  
E-mail gcspla@yahoo.co.kr  
URL www.gcspla.co.kr

Available in: Worldwide



Application use: Biodegradable bag for 2008 Beijing Olympic team

EM-2-003

Polymers

biodegradable resin

## GCS-PLA GC8000T (RESIN)

## Environmental performance

1. These biodegradable products contribute to reduced environmental problems caused by conventional plastic wastes.
2. These biodegradable products are stable in the atmosphere but they are decomposed by living microorganisms in compost, wet soil, and the sea.
3. These biodegradable products can be recycled several times in most conventional plastic processing equipment.

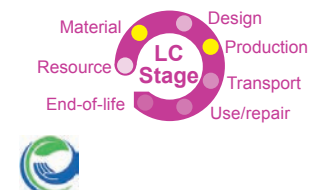
## Product performance

This biodegradable resin (GC8000T) is used for injection and extrusion of molded products such as spoons, forks, knives, chopping boards, and straws.

## Green Chemical Co., Ltd

17-3, Yangpyeong-Ri, Moga-Myeon, Icheon-City, Kyunggi-Do, 467-873,  
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E-mail gcspla@yahoo.co.kr  
URL www.gcspla.co.kr

Available in: Worldwide



Applicable products : spoon, fork, knife, chopping board

EM-2-004

Polymers

biodegradable resin

## GCS-PLA GC8000R (Pellet)

## Environmental performance

1. These biodegradable products contribute to reduced environmental problems caused by conventional plastic wastes.
2. These biodegradable products are stable in the atmosphere but they are decomposed by living microorganisms in compost, wet soil, and the sea.
3. These biodegradable products can be recycled several times in most conventional plastic processing equipment.

## Product performance

GCS-PLA (GC8000R) is used for biodegradable garbage bags, compost bags, and shopping bags.

## Green Chemical Co., Ltd

17-3, Yangpyeong-Ri, Moga-Myeon, Icheon-Si, Kyunggi-Do, 467-873,  
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E-mail gcspla@yahoo.co.kr  
URL www.gcspla.co.kr

Available in: Worldwide



Application use : Biodegradable garbage bag and shopping bag and roll bag



EM-2-005

Polymers

plastic resin

R3plas Eco-label Recycled Plastics Resins

Environmental performance

R3plas Recycled Resin from closed-loop system.  
From collecting post industrial plastics waste to consumer plastics waste to reprocess with our technology from Disassembly, Sorting, Crushing, Pellet extrusion, color compounding, pigments, additives and testing, etc tooling, manufacturing to export of finished products.

Product performance

Good performance as prime virgin resin  
Innovative products and environment friendly  
Awards design for green products  
Green label awards  
Meet ISO 14000 and green purchasing policy



R3plas Eco-label recycled plastics resins for Flower planter box

WINRIGO (S) PTE LTD

No.21 Toh Guan Road East #04-09 Toh Guan Centre Singapore, 608609, Singapore  
Tel +65-98715058 Fax +65-65154557  
E-mail salewin@singnet.com.sg  
URL www.winrigo.com.sg  
URL www.winrigo.com.sg  
URL www.winrigo.com.sg

Available in: Worldwide

EM-2-006

Polymers

plastic resin

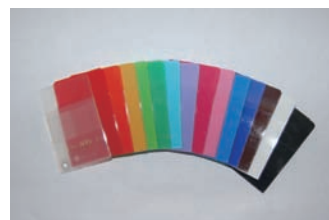
R3plas Eco-label Recycled Plastic resin

Environmental performance

Collection from post industrial waste like runner, end of life products, post industrial packaging and post consumer packaging etc

Product performance

R3plas Recycled PC  
R3plas Recycled PS  
R3plas Recycled PP  
R3plas Recycled PE  
R3plas Recycled ABS  
R3plas Recycled LCP  
R3plas Recycled PA  
R3plas Recycled PPS



R3plas Eco-label recycled plastic resin after color compounding

WINRIGO (S) PTE LTD

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E-mail salewin@singnet.com.sg  
URL www.winrigo.com.sg  
URL www.winrigo.com.sg  
URL www.winrigo.com.sg

EM-2-007

Polymers

plastic resin

## R3plas Bio-mass pellet (rice husk, wheat husk, coconut husk)

### Environmental performance

Rice husk, Wheat husk and Coconut husk is world most easily available and renewable source and ideal for alternative wood. It is natural and carbon neutral and thereby helps mitigation of the global warming. It help prevent deforestation in Asia and help to save wildlife as well.

### Product performance

Better water resistant than wood  
Termite and fungus proof  
Compositable  
recyclability  
sustainable manufacturing  
easy coloring  
eco-friendly  
cost competitive  
eco-function in design

## WINRIGO (S) PTE LTD

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URL [www.winrigo.com.sg](http://www.winrigo.com.sg)  
URL [www.winrigo.com.sg](http://www.winrigo.com.sg)

Available in: Worldwide



11.53kg-CO <sub>2</sub>	Resource/Materials/Production/Transfer/Use/End-of-Life
Inspection	



Eco-products made from Biomass technology

EM-2-008

Polymers

lactic acid resin

## ECOLA

### Environmental performance

Kao has integrated the quality of ECOLA, its polylactic acid resin product, to save cycle time within the production process which contributes to the reduction of environmental burden.

1. Has realized injection molding that saves time to nearly the same extent as molding widely-used resin.

Conventional molding condition : 110°C X 10min.

New molding condition (with ECOLA) : 80°C X 30sec at most.

2. Has realized extrusion molding of transparent and soft materials such as sheet-shaped products.

### Product performance

Kao contributes to a more easier use of eco-friendly biomass-based polymer.

In addition to the plasticity control technology that has improved the softness of molded products, our unique nano-crystal control technology has realized the products' transparency. These technologies have made it possible to expand the wide use of polylactic acid resin to plastic products.

Extrusion-molding-targeted ECOLA enables molding of sheet-shaped or film-shaped products such as transparent folders, which resemble products made of PP.

On the other hand, injection-molding-targeted ECOLA saves the molding time to nearly the same extent as molding such commonly-used resins as ABS or PP without losing the impact resistance or heat resistance after molding.

## Kao Corporation

1-14-10, Nihonbashi Kayabacho, Chuo-ku, Tokyo, Japan  
URL <http://chemical.kao.com/index.html>  
URL <http://www.kao.com/group/en/group/csr.html>

Available in: Japan, China



ECOLA

EM-2-009

Polymers

stabilisers

## Non-Toxic One Pack PVC Stabilisers

## Environmental performance

Non-toxic one pack PVC stabilisers are free from heavy metal ingredients and offer efficient stabilisation and processability during the manufacturing of PVC products.

## Product performance

Sun Ace's Non-toxic one pack PVC stabiliser comply with RoHS requirements for electrical application and European Food Safety Authority (EFSA) for food-in-contact applications like drinking water pipes.



## Sun Ace Kakoh (Pte.) Ltd

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 E-mail sales@sunace.com.sg  
 URL www.sunace.com.sg  
 URL www.sunace.com.sg  
 URL www.sunace.com.sg



Available in: Worldwide

EM-2-010

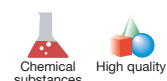
Polymers

epoxy molding compound

## SUMIKON EME

## Environmental performance

Sumitomo Bakelite has developed an epoxy resin molding material for semiconductor sealing that is free of bromine- and antimony-based flame retardants, which have a negative impact on the environment, is free of substances for which there is concern about their environmental impact, and conforms with global environmental standards as a molding material that can be used in lead-free solder mounting. The company has developed and marketed the new SUMIKON EME G700 series for applications that require high reliability and the new SUMIKON EME G600 series for ordinary semiconductor package applications, all of which use an epoxy resin with superior fire retardant capabilities. We have also launched the SUMIKON EME E series for discrete applications.



## Sumitomo Bakelite Co., Ltd.

2-5-8, Higashishinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan



## EM-2-011

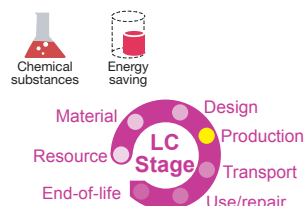
## Polymers

## wafer coating materials

## SUMIRESIN EXCEL CRC

## Environmental performance

To respond to narrowing circuit widths required due to the sharp increase in semiconductor memory capacity as well as higher speeds and to satisfy strict demands for reliability, Sumitomo Bakelite has developed and marketed the SUMIRESIN EXCEL CRC 8000 series of positive photosensitive wafer coating resins. This enables semiconductor manufacturers to use alkaline water as a developing fluid and pure water as a rinsing solution, rendering special solvents unnecessary. In addition, with certain wafer level packages, it can be used in place of conventional plastic-based sealants for rewiring, reducing the length of processing and thus conserving resources and energy.



## Sumitomo Bakelite Co., Ltd.

Tennosu Parkside Bldg., 2-5-8, Higashishinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan



## EM-2-012

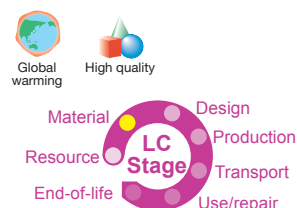
## Polymers

## phenolic molding compounds

## SUMIKON PM

## Environmental performance

In order to save weight of automotive mechanical parts with metal replacement, SUMITOMO BAKELITE CO., LTD. develops and commercializes excellent phenolic molding compounds which has high strength, high rigidity, good dimensional stability and high reliability by unique formulation of various additives and fillers with phenolic resin which has high heat resistance and excellent chemical resistance. The SUMIKON® PM series is widely used as automotive mechanical parts, such as FEAD pulleys, disc brake pistons and water pump covers.



## Sumitomo Bakelite Co., Ltd.

2-5-8, Higashishinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan



EM-2-013

Polymers

fiber materials

## Eco-friendly material using solution-dyeing fibers made of recycled plastic bottles: Shagarl

## Environmental performance

- \* Eco Mark certificate number 05104041 (95% Recycled PET Fiber)
- \* 100% recycled plastic bottle material
- \* No formaldehyde
- \* Excellent in energy conservation (Air-conditioning electricity bills are reduced by 70% with external sun-shading)

## Product performance

- \* Fireproof (authorized by the Japan Fire Retardant Association [JFRA] as Flame-retardant product): Flame retardant product
- \* Excellent weather resistance (solution-dyeing fibers are used)
- \* Waterproof property (resistance to 1000 mm of water pressure)



## N.I. TEIJIN SHOJI CO.,LTD.

Teijin Bldg., 6-7, Minami-hommachi 1-chome, Chuo-ku, Osaka, Japan  
 Tel +81-6-6266-8116 Fax +81-6-6244-1980  
 E-mail knoda24113@ni-teijinshoji.co.jp  
 URL <http://www2.ni-teijinshoji.co.jp/>  
 URL <http://tent.teijin.co.jp>  
 URL <http://www.teijin.co.jp>



Available in: Japan

Shagarl for awning

EM-3-001

Natural materials

heat-resistant polylactic acid

**BIOFRONT® , heat resistant polylactic acid**

**Environmental performance**

BIOFRONT® offers significantly higher heat-resistance and crystallization rate than conventional bioplastics.

**Product performance**

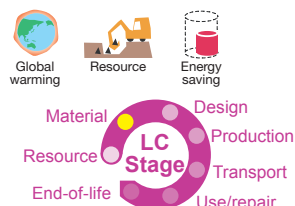
BIOFRONT® is a stereocomplex PLA that has a melting point of 210°C , or 40°C higher than conventional PLA. Teijin has successfully upgraded BIOFRONT® with substantially improved hydrolytic resistance. These meet practical requirements in industrial markets such as automotive, office equipment and electronics.

**\*Stereocomplex PLA**

The unique crystal structure composed of L-molecule and its optical isomer D-molecule are behind the new physical properties that include high heat-resistant characteristics

**Teijin Limited**

2-1, Kasumigaseki 3-chome, Chiyoda-ku, Tokyo, 100-8585, Japan  
Tel +81-3-3506-4096  
E-mail [biofront@teijin.co.jp](mailto:biofront@teijin.co.jp)  
URL <http://www.teijin.co.jp/english/index.html>



solar panels set up in apartment house rooftop

EM-3-002

Natural materials

synthetic fiber

**Crafts from Banana Fiber**

**Environmental performance**

Fiber extracted from Banana sheeth is bio-degradable as well have long life. Banana fiber is extracted from the waste part of banana tree. It gives employem to poortunity for the poor.

**Product performance**

Crafts made from Banana fiber is soft in nature. Any kind of craft materials could be made from Banana Fiber. Even sarees are incorporating Banana fiber which give cool effect to the body.

**Mother Theresa Development Research Institute**

No.4/3B, Freeman Street, Kottapattu, Golden Rock Post, Ponmalaipatti, Trichy, 620004, Tamil Nadu, South India  
Tel +91-431-2491671  
E-mail [mt dri2000@gmail.com](mailto:mt dri2000@gmail.com)  
URL <http://www.freewebs.com/mt dri>



A basket made from banana fiber - easy to handle and at affordable cost.

Available in: Worldwide

EM-3-003

Natural materials

cotton fabrics

BREVARO ECO: Anti-flaming, antistatic fabric of ecology-specs

Environmental performance

Fabric made from blending of excellent flameproof acrylic fiber and unused cotton generated during spinning process accounting for 10% of total material.  
- Designated "EcoMark certified product", Japan's environmental label.

Product performance

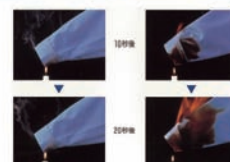
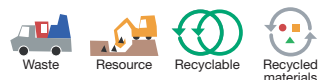
- Having excellent anti-flaming property coupled with self-extinguishing property. LOI\* (limited oxygen index) 29 to 32.
- Excellent in non-fusibility, compared with 100% general synthetic fibers. Safe as it would not stick to skin.
- Having superior antistatic property (complying with JIS8118:friction static electrical charge less than 7micro C/m<sup>2</sup>)
- Refreshing and easy-to wear, due to their excellent sweat absorption.
- Will not pill.
- Good coloring, good color fastness.

\* Note: LOI is a measure to show the degree of flammability. The less flammable, the higher the figure is. Generally, anti-flammable materials show the figure of 26 or higher.

KURABO INDUSTRIES LTD.

4-31, 2-Chome, Kyutaro-machi, Chuo-ku, Osaka, 541-8581, Japan  
Tel +81-6-6266-5295 Fax +81-6-6266-5539  
E-mail uniform\_sect@kurabo.co.jp  
URL <http://www.kurabo.co.jp/>

Available in: Japan, Worldwide



Combustion test

EM-3-004

Natural materials

cotton fabrics

BioNature: Eco-oriented soil-returnable fabric

Environmental performance

Bionature is a fabric made from natural fiber and eco-friendly polyester of DUPONT (TM).

Bionature collapses in the compost with which environment was ready. The reduction of its weight and the loss of its molecular weight show the decomposition of Bionature in the compost.

Safety is identified from the composts obtained in the decomposition process that have no impact on the earthworm reproduction and plants growth.

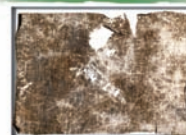
Product performance

The physical properties are strengthened without spoiling the biodegradation of natural materials, such as cotton and wool.

KURABO INDUSTRIES LTD.

4-31, 2-Chome, Kyutaro-machi, Chuo-ku, Osaka, 541-8581, Japan  
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E-mail uniform\_sect@kurabo.co.jp  
URL <http://www.kurabo.co.jp/>

Available in: Japan, Worldwide



Regular Polyester

Fabrics buried in the ground for 10 months



EM-3-005

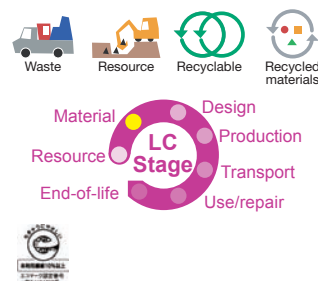
Natural materials

cotton fabrics

## Return Cotton: An eco-friendly material for a sound recycling society

### Environmental performance

Return Cotton is produced using our unique technology by recycling various unused fibers such as waste cotton generated in the cotton-spinning process. This is an eco-friendly material aimed at helping to achieve a sound recycling society. (Designated "Eco Mark certified product", Japan's environment label.)



### KURABO INDUSTRIES LTD.

4-31, 2-Chome, Kyutaro-machi, Chuo-ku, Osaka, 541-8581, Japan  
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E-mail [uniform\\_sect@kurabo.co.jp](mailto:uniform_sect@kurabo.co.jp)  
URL <http://www.kurabo.co.jp/>



Available in: Japan, Worldwide

EM-3-006

Natural materials

cotton fabrics

## EARTHDENIM: New feel denim born from our Eco-oriented research.

### Environmental performance

EARTHDENIM makes effective reuse of waste from each stage of production.

- EARTHDENIM is made by recycling denim production waste.
- A pair of jeans made of EARTHDENIM reduces CO<sub>2</sub> in a quantity equivalent to the quantity absorbed by about 180 four-leafed-clovers a year.

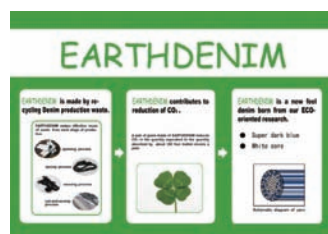
### Product performance

It makes possible a super dark blue color as unmatched by normal dyeing. And it contributes to reduction of CO<sub>2</sub>.

- Super dark blue and White core

### KURABO INDUSTRIES LTD.

4-31, 2-Chome, Kyutaro-machi, Chuo-ku, Osaka, 541-8581, Japan  
Tel +81-6-6266-5326 Fax +81-6-6266-5204  
E-mail [casual\\_sect@kurabo.co.jp](mailto:casual_sect@kurabo.co.jp)  
URL <http://www.kurabo.co.jp/>



Available in: Japan, Worldwide



## EM-3-007

## Natural materials

pure worsted yarn

## ECO · WASH: Eco-friendly shrink-resistant wool

## Environmental performance

Conventional chlorination treatment applied for shrink-proofing of wool fiber causes environmental contamination.

This is because residual chlorine in industrial waste water drained into rivers reacts with organic matter and turns into a carcinogen (AOX=Absorbable Halogens), a harmful substance to humans and the environment.

In ECO-WASH's case, ozone is used instead of chlorine, which is non-AOX and greatly reduces the burden of contamination to the environment, and further, it has much less damaging effects to wool fiber than done by the conventional chlorine treatment for shrink-proofing.

## Product performance

ECO-WASH is the world first shrink-resistant wool by ozone treatment.

- Smooth and neat surface look, fluffiness
- Natural stretchability
- Excellent shrink-resistance
- Water repellency is retained (together with moisture releasing property of wool makes ECO-WASH comfortable)

## KURABO INDUSTRIES LTD.

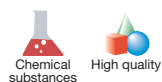
4-31, 2-Chome, Kyutaro-machi, Chuo-ku, Osaka, 541-8581, Japan

Tel +81-6-6266-5408 Fax +81-6-6266-5119

E-mail takaharu\_nakayama@kurabo.co.jp

URL <http://www.kurabo.co.jp>

Available in: Japan, Worldwide



Water repellent test of various treated wool

## EM-3-008

## Natural materials

common plywood

## JAPANESE DOMESTIC WOOD MATERIAL PLYWOOD WITH CARBON FOOTPRINTING

## Environmental performance

As for the domestic wood that the Sumitomo Forestry group has positively used in Japan, the amount of the CO<sub>2</sub> exhaust at the procurement stage of the raw material can be greatly little compared with the import wood for which the long-distance transportation is necessary. Sumitomo Forestry Crest.Co.LTD manufacture plywood with using raw material switch from imported wood to domestic wood, as a result reduction of 1.2kg CO<sub>2</sub> in one sheet of plywood. A further CO<sub>2</sub> exhaust amount reduction is scheduled in the Sumitomo Forestry Crest. based on the numerical value displayed this time. Moreover, the use of the carbon footprint system to which institutionalization is advanced aiming at the market introduction is scheduled to be examined in the future though this display becomes an independent display.



2.91kg-CO <sub>2</sub>	Resource/Materials/Production/Transfer/Use/End-of-Life
not Inspection	

## SUMITOMO FORESTRY CREST CO.,LTD.

3-26 KANDA NISHIKI-CHOU, CHIYODA-KU, TOKYO, Japan

Available in: Japan



Japanese Wood Plywood with Carbon Footprint

EM-3-009

Natural materials

particle boards

## Labeling Particle Boards Products with Carbon Footprint Mark

### Environmental performance

PT. Rimba Partikel Indonesited is related companies of Sumitomo Forestry manufacturing particle boards began an independent "Carbon footprint" display in Indonesia in October, 2009

As for "Carbon footprint" display to the wood product by an Indonesian enterprise, the RPI Co. becomes the first attempt. Produced PB is use, and ecologically friendly product in the RPI Co. as the raw material in effective the resource as for the surplus material, the scrap, and its own afforestation tree in the woods. As for RPI, the wood biomass power generation was introduced in 2008 and the less amount of the CO<sub>2</sub> exhaust with using clean energy. The use of the carbon footprint system to which institutionalization is advanced aiming at the market introduction is scheduled to be examined in the future though this display becomes an independent display.

156.8kg-CO<sub>2</sub> per m<sup>3</sup>



Global warming



Energy saving



156.8kg-CO<sub>2</sub>

not Inspection

Resource/Materials/Production/  
Transfer/Use/End-of-Life

### PT. Rimba Partikel Indonesia

KENDAL,JAWA, TENGAH51372 INDONESIA, Indonesia

Tel +62-248662990 Fax +62-248662988

URL <http://sfc.jp/english/>

URL <http://sfc.jp/english/pdf/20090929.pdf>



Available in: Indonesia, Malaysia, China

Labeling Particle Board Products with Carbon Footprint Mark

EM-3-010

Natural materials

paper

## U-PET Paper (synthetic printing paper manufactured using recycled PET materials)

### Environmental performance

Over 99% recycled PET materials

### Product performance

Synthetic printing paper manufactured using recycled PET materials. Suitable for offset printing and laser printing. Matt surface with water permeability. Can be written on with pencil, oil pen, permanent marker, etc.



Resource



Recyclable



PET

### Active Life co.ltd.

5-8 Suehiro, Suwa-city, Nagano, 392-0025, Japan

Tel +81-266-52-3490 Fax +81-266-58-0167

E-mail [info@active-life.co.jp](mailto:info@active-life.co.jp)

URL <http://www.active-life.co.jp/>



U-PET Paper

EM-3-011

Natural materials

plastic resin

R3plas Biocomposites resin -Rice Husk, Wheat Husk

Environmental performance

R3plas Bio-composite is development from Bio-mass, Rice Husk or Wheat husk which is non food crop.

R3plas Bio-composite resin made up of 70-90% of renewable source and Recycled Plastics waste.

Help to prevent deforestation by provide alternative to woods demand.

Double reduction in CO<sub>2</sub> through LCA.

Product performance

Better water Resistant than wood

Termite and Fungus proof

Weather proof

Reuseability and recyclability

Easy coloring

easy Processability

New Design Possibility (flexible)

Eco-friendly

cost effective

WINRIGO (S) PTE LTD

No 21 Toh Guan Road East #04-09 Toh Guan Centre, 608609, Singapore

Tel +65-63101396 Fax +65-65154557

E-mail salewin@singnet.com.sg

URL www.winrigo.com.sg

URL www.winrigo.com.sg

URL www.winrigo.com.sg

Available in: Worldwide



11.158kg-CO<sub>2</sub>

Inspection

Resource/Materials/Production/  
Transfer/Use/End-of-Life



Planter cell made from Bio-composite Resin Rice husk

EM-3-012

Natural materials

plastic

R3plas Eco-Pallet from Bio-Mass -Rice husk and Wheat husk

Environmental performance

Rice husk is one of world largest easily available Bio-mass and an ideal alternative to wood. It meets Japan Bioplastics Association & International standard of Bio masPla. Is it Carbon -neutral thereby helps mitigation of the global warming and they contribute to reduce the consumption of fossil resources.

Product performance

Better water resistant than wood

Termite and fungus proof

weather proof

Reusability and recyclability

Design possible

eco-friendly

cost competitive

easy colouring

sustainable manufacturing

WINRIGO (S) PTE LTD

No 21 Toh Guan Road East #04-09 Toh Guan Centre, 608609, Singapore

Tel +65-63101396 Fax +65-65154557

E-mail salewin@singnet.com.sg

URL www.winrigo.com.sg

URL www.winrigo.com.sg

URL www.winrigo.com.sg

Available in: Worldwide



11.58kg-CO<sub>2</sub>

Inspection

Resource/Materials/Production/  
Transfer/Use/End-of-Life



R3plas Eco-pallet from Bio-mass (rice husk & wheat husk)

## EM-3-013

## Natural materials

corn fiber

## handle cup corn\_small

## Environmental performance

Is completely decomposed by microorganisms when buried.  
 Environment with no human hormone is harmless ingredients.  
 To reduce greenhouse gas emissions is a future-oriented material.  
 Plastic properties of the oil is replaced.  
 Material is environmentally certified.  
 Therefore, prevention of global warming prevent effects, water and soil, air pollution has the ability to prevent.

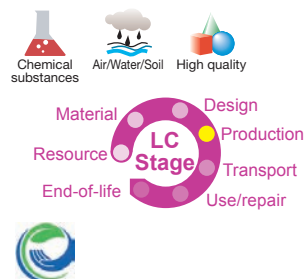
## Product performance

Cup is easy to use, the better use children.  
 Pretty colors, cute shape.  
 Get the handle to fill the water can be easily moved.  
 Environment, free from worry of hormones.  
 Is effective in preventing environmental hormones. Size is also easy to use. The kids can even use. This beautiful color, beautiful appearance. The product is environmentally friendly material.

## CS Dongyang Co.,LTD.

Neungwon-ri Mohyun-myeon Cheoin-gu Yongin-si Gyeonggi-do, Republic of Korea  
 Tel +82-31-322-1736

Available in: Republic of Korea



## EM-3-014

## Natural materials

corn fiber

## Handle cup corn\_medium

## Environmental performance

Is completely decomposed by microorganisms when buried.  
 Environment with no human hormone is harmless ingredients.  
 To reduce greenhouse gas emissions is a future-oriented material.  
 Plastic properties of the oil is replaced.  
 Material is environmentally certified.  
 Therefore, prevention of global warming prevent effects, water and soil, air pollution has the ability to prevent.

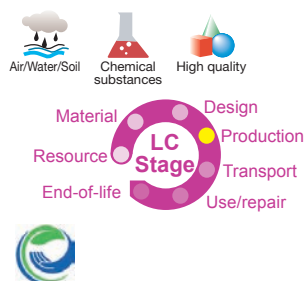
## Product performance

Cup is easy to use, the better use children.  
 Pretty colors, cute shape.  
 Get the handle to fill the water can be easily moved.  
 Environment, free from worry of hormones.  
 Is effective in preventing environmental hormones. Size is also easy to use. The kids can even use. This beautiful color, beautiful appearance. The product is environmentally friendly material.

## CS Dongyang Co.,LTD.

Neungwon-ri Mohyun-myeon Cheoin-gu Yongin-si Gyeonggi-do, Republic of Korea  
 Tel +82-31-322-1736

Available in: Republic of Korea



## EM-3-015

## Natural materials

corn fiber

## Corn mini-cup

## Environmental performance

Is completely decomposed by microorganisms when buried.  
 Environment with no human hormone is harmless ingredients.  
 To reduce greenhouse gas emissions is a future-oriented material.  
 Plastic properties of the oil is replaced.  
 Material is environmentally certified.  
 Therefore, prevention of global warming prevent effects, water and soil, air pollution has the ability to prevent.

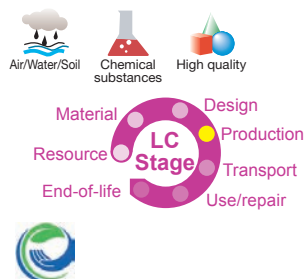
## Product performance

Children's hands is just the right size of a small cup.  
 The characters are printed outside of the cup.  
 The size of the circular cup is easy to catch.  
 Environmental hormones are not harmless.

## CS Dongyang Co.,LTD.

Neungwon-ri Mohyun-myeon Cheoin-gu Yongin-si Gyeonggi-do, Republic of Korea  
 Tel +82-31-322-1736

Available in: Republic of Korea



Children's hands is just the right size of a small cup.

## EM-3-016

## Natural materials

corn fiber

## Hart cup corn

## Environmental performance

Is completely decomposed by microorganisms when buried.  
 Environment with no human hormone is harmless ingredients.  
 To reduce greenhouse gas emissions is a future-oriented material.  
 Plastic properties of the oil is replaced.  
 Material is environmentally certified.  
 Therefore, prevention of global warming prevent effects, water and soil, air pollution has the ability to prevent.

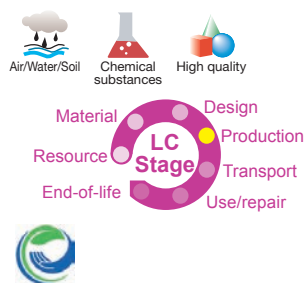
## Product performance

Cup is easy to use, the better use children.  
 Pretty colors, cute shape.  
 Get the handle to fill the water can be easily moved.  
 Environment, free from worry of hormones.  
 Is effective in preventing environmental hormones. Size is also easy to use. The kids can even use. This beautiful color, beautiful appearance. The product is environmentally friendly material.

## CS Dongyang Co.,LTD.

Neungwon-ri Mohyun-myeon Cheoin-gu Yongin-si Gyeonggi-do, Republic of Korea  
 Tel +82-31-322-1736

Available in: Republic of Korea



## EM-3-017

## Natural materials

corn fiber

## Corn soup bowl

## Environmental performance

Is completely decomposed by microorganisms when buried.  
 Environment with no human hormone is harmless ingredients.  
 To reduce greenhouse gas emissions is a future-oriented material.  
 Plastic properties of the oil is replaced.  
 Material is environmentally certified.  
 Therefore, prevention of global warming prevent effects, water and soil,air pollution has the ability to prevent.

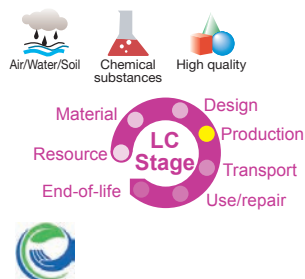
## Product performance

Can be used to eat the soup or stew.  
 Corn was used as an ingredient.  
 From environmental hormones are harmless.  
 Can be used for different purposes.  
 It is a bowl of corn ingredients. It is easy to eat soup or stew. Can be used for different purposes. From environmental hormones are harmless.

## CS Dongyang Co.,LTD.

Neungwon-ri Mohyun-myeon Cheoin-gu Yongin-si Gyeonggi-do, Republic of Korea  
 Tel +82-31-322-1736

Available in: Republic of Korea



## EM-3-018

## Natural materials

corn fiber

## Corn bowl

## Environmental performance

Is completely decomposed by microorganisms when buried.  
 Environment with no human hormone is harmless ingredients.  
 To reduce greenhouse gas emissions is a future-oriented material.  
 Plastic properties of the oil is replaced.  
 Material is environmentally certified.  
 Therefore, prevention of global warming prevent effects, water and soil,air pollution has the ability to prevent.

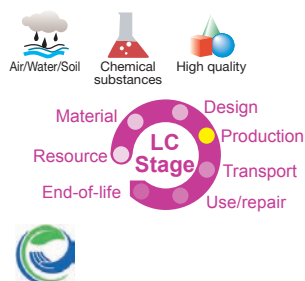
## Product performance

Can be used to eat the soup or stew.  
 Corn was used as an ingredient.  
 From environmental hormones are harmless.  
 Can be used for different purposes.  
 It is a bowl of corn ingredients. It is easy to eat soup or stew. Can be used for different purposes. From environmental hormones are harmless.

## CS Dongyang Co.,LTD.

Neungwon-ri Mohyun-myeon Cheoin-gu Yongin-si Gyeonggi-do, Republic of Korea  
 Tel +82-31-322-1736

Available in: Republic of Korea





EM-3-019

Natural materials

corn fiber

Corn Square tray

Environmental performance

Is completely decomposed by microorganisms when buried.  
Environment with no human hormone is harmless ingredients.  
To reduce greenhouse gas emissions is a future-oriented material.  
Plastic properties of the oil is replaced.  
Material is environmentally certified.  
Therefore, prevention of global warming prevent effects, water and soil,air pollution has the ability to prevent.

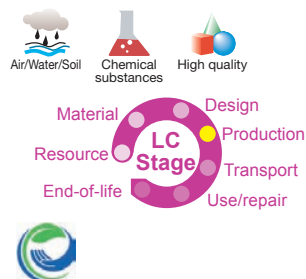
Product performance

Environment, free from worry of hormones .  
It is Yellow collar.  
Compartment of the tray so you can hold a variety of foods.  
The tray compartment, and the color is yellow. Beautiful pictures are printed.  
Environment, free from worry of hormones . Children can separate the food.

CS Dongyang Co.,LTD.

Neungwon-ri Mohyun-myeon Cheoin-gu Yongin-si Gyeonggi-do, Republic of Korea  
Tel +82-31-322-1736

Available in: Republic of Korea



EM-3-020

Natural materials

corn fiber

Corn fork spoon set 4P

Environmental performance

Is completely decomposed by microorganisms when buried.  
Environment with no human hormone is harmless ingredients.  
To reduce greenhouse gas emissions is a future-oriented material.  
Plastic properties of the oil is replaced.  
Material is environmentally certified.  
Therefore, prevention of global warming prevent effects, water and soil,air pollution has the ability to prevent.

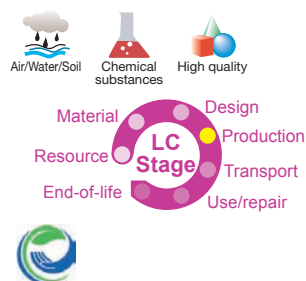
Product performance

Environment, free from worry of hormones .  
2 spoons and 2 forks to a set of items is achieved.  
Easy to use, and is particularly suitable for children's sizes.  
Beautiful pictures are printed on the handle.  
Environment, free from worry of hormones . Yellow is the color of the product, pretty pictures are printed on the handle.

CS Dongyang Co.,LTD.

Neungwon-ri Mohyun-myeon Cheoin-gu Yongin-si Gyeonggi-do, Republic of Korea  
Tel +82-31-322-1736

Available in: Republic of Korea



EM-3-021

Natural materials

corn fiber

Corn Spoon Chopsticks case

Environmental performance

Is completely decomposed by microorganisms when buried.  
Environment with no human hormone is harmless ingredients.  
To reduce greenhouse gas emissions is a future-oriented material.  
Plastic properties of the oil is replaced.  
Material is environmentally certified.  
Therefore, prevention of global warming prevent effects, water and soil, air pollution has the ability to prevent.

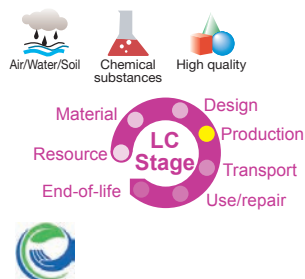
Product performance

When you go to a picnic or a trip to carry a spoon and chopsticks are for the case. Lightweight and can be a long time I did not break. Easy to clean and have freedom from worry about environmental hormones.  
Yellow is the color of the product, the lid is a lovely character picture is printed. You can easily open and close the lid.

CS Dongyang Co.,LTD.

Neungwon-ri Mohyun-myeon Cheoin-gu Yongin-si Gyeonggi-do, Republic of Korea  
Tel +82-31-322-1736

Available in: Republic of Korea



EM-3-022

Natural materials

corn fiber

CornWare

Environmental performance

CornWare is a range of eco-friendly, 100% biodegradable disposable tableware made from corn. It will biodegrade after 90 days upon discharge and is also carbon neutral. CornWare has also been awarded accreditations by Green Label Singapore & ISO for Biodegradability & Environmental Management.

Product performance

CornWare is sturdy, reliant and safe for use for adults and kids alike. It doesn't snap or break easily due to its strong structure.  
CornWare is microwaveable, acid & alkali proof, water & leakage proof and able to withstand temperatures from -20°C to 150°C. It is certified safe and toxin-free by the FDA.

Olive Green Marketing Pte Ltd.

63 Hillview Avenue #03-08 Lam Soon Industrial Building, 669569, Singapore  
Tel +65-67671301 Fax +65-67679908  
E-mail marketing@olivegreen.com.sg  
URL www.olivegreen.com.sg

Available in: Singapore





## EM-3-023

## Natural materials

corn fiber

## CornWare

## Environmental performance

CornWare is a range of eco-friendly, 100% biodegradable disposable tableware made from corn. It will biodegrade after 90 days upon discharge and is also carbon neutral. CornWare has also been awarded accreditations by Green Label Singapore & ISO for Biodegradability & Environmental Management.

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Global warming



Degradable



Biodegradable cups made from corn

## Olive Green Marketing Pte Ltd.

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E-mail [marketing@olivegreen.com.sg](mailto:marketing@olivegreen.com.sg)  
URL [www.olivegreen.com.sg](http://www.olivegreen.com.sg)

## EM-3-024

## Natural materials

corn fiber

## CornWare

## Environmental performance

CornWare is a range of eco-friendly, 100% biodegradable disposable tableware made from corn. It will biodegrade after 90 days upon discharge and is also carbon neutral. CornWare has also been awarded accreditations by Green Label Singapore & ISO for Biodegradability & Environmental Management.

## Product performance

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Global warming



Degradable



Biodegradable 9" plate

## Olive Green Marketing Pte Ltd.

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URL [www.olivegreen.com.sg](http://www.olivegreen.com.sg)

## EM-3-025

## Natural materials

corn fiber

## CornWare

## Environmental performance

CornWare is a range of eco-friendly, 100% biodegradable disposable tableware made from corn. It will biodegrade after 90 days upon discharge and is also carbon neutral. CornWare has also been awarded accreditations by Green Label Singapore & ISO for Biodegradability & Environmental Management.

## Product performance

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URL [www.olivegreen.com.sg](http://www.olivegreen.com.sg)



Biodegradable 6" dessert plate

## EM-3-026

## Natural materials

corn fiber

## CornWare

## Environmental performance

CornWare is a range of eco-friendly, 100% biodegradable disposable tableware made from corn. It will biodegrade after 90 days upon discharge and is also carbon neutral. CornWare has also been awarded accreditations by Green Label Singapore & ISO for Biodegradability & Environmental Management.

## Product performance

CornWare is sturdy, reliable, and safe for use for adults and kids alike. It doesn't snap or break easily due to its strong structure. CornWare is microwaveable, acid- and alkali-proof, water- and leakage-proof, and able to withstand temperatures from -20°C to 150°C. It is certified safe and toxin-free by the FDA.



Biodegradable dessert bowl

## EM-3-027

## Natural materials

corn fiber

## CornWare

## Environmental performance

CornWare is a range of eco-friendly, 100% biodegradable disposable tableware made from corn. It will biodegrade after 90 days upon discharge and is also carbon neutral. CornWare has also been awarded accreditations by Green Label Singapore & ISO for Biodegradability & Environmental Management.

## Product performance

CornWare is sturdy, reliable, and safe for use for adults and kids alike. It doesn't snap or break easily due to its strong structure. CornWare is microwaveable, acid- and alkali-proof, water- and leakage-proof, and able to withstand temperatures from -20°C to 150°C. It is certified safe and toxin-free by the FDA.



Global warming



Degradable



Biodegradable lunch box

## Olive Green Marketing Pte Ltd.

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URL [www.olivegreen.com.sg](http://www.olivegreen.com.sg)

## EM-3-028

## Natural materials

corn fiber

## CornWare

## Environmental performance

CornWare is a range of eco-friendly, 100% biodegradable disposable tableware made from corn. It will biodegrade after 90 days upon discharge and is also carbon neutral. CornWare has also been awarded accreditations by Green Label Singapore & ISO for Biodegradability & Environmental Management.

## Product performance

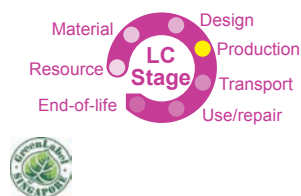
CornWare is sturdy, reliable, and safe for use for adults and kids alike. It doesn't snap or break easily due to its strong structure. CornWare is microwaveable, acid- and alkali-proof, water- and leakage-proof, and able to withstand temperatures from -20°C to 150°C. It is certified safe and toxin-free by the FDA.



Global warming



Degradable



Biodegradable noodle bowls

## Olive Green Marketing Pte Ltd.

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EM-3-029

Natural materials

corn fiber

## CornWare

### Environmental performance

CornWare is a range of eco-friendly, 100% biodegradable disposable tableware made from corn. It will biodegrade after 90 days upon discharge and is also carbon neutral. CornWare has also been awarded accreditations by Green Label Singapore & ISO for Biodegradability & Environmental Management.

### Product performance

CornWare is sturdy, reliable, and safe for use for adults and kids alike. It doesn't snap or break easily due to its strong structure. CornWare is microwaveable, acid- and alkali-proof, water- and leakage-proof, and able to withstand temperatures from -20°C to 150°C. It is certified safe and toxin-free by the FDA.

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URL [www.olivegreen.com.sg](http://www.olivegreen.com.sg)



Set of biodegradable cutlery

EM-3-030

Natural materials

corn fiber

## CornWare

### Environmental performance

CornWare is a range of eco-friendly, 100% biodegradable disposable tableware made from corn. It will biodegrade after 90 days upon discharge and is also carbon neutral. CornWare has also been awarded accreditations by Green Label Singapore & ISO for Biodegradability & Environmental Management.

### Product performance

CornWare is sturdy, reliable, and safe for use for adults and kids alike. It doesn't snap or break easily due to its strong structure. CornWare is microwaveable, acid- and alkali-proof, water- and leakage-proof, and able to withstand temperatures from -20°C to 150°C. It is certified safe and toxin-free by the FDA.

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URL [www.olivegreen.com.sg](http://www.olivegreen.com.sg)



Biodegradable dessert spoon

EM-3-031

Natural materials

plastic bags

R3plas Oxo-biodegradable plastic packaging

Environmental performance

Degrades with presence of UV, thermal and oxidation.  
Environmental friendly and good transparency  
Supports Governmental  
ISO 14000  
Meets ATSM standards.  
Member of Oxo-Biodegradable Plastics Institute, USA  
www.biodeg.org

Product performance

R3plas Oxo-biodegradable plastics shopping bags  
R3plas Oxo-biodegradable plastics food trays  
R3plas Oxo-biodegradable anti-static bubble bags  
R3plas Oxo-biodegradable garbage bag in rolls  
R3plas Oxo-biodegradable conductive bag for semi-conductor industry  
R3plas Oxo-biodegradable clean room bags  
R3plas Oxo-biodegradable disposable cups  
R3plas Oxo-biodegradable disposable cultery  
R3plas Oxo-biodegradable agricultural seeding bags  
R3plas Oxo-Biodegradable food containers

WINRIGO (S) PTE LTD

No 21 Toh Guan Road East #04-09 Toh Guan Centre, 608609, Singapore  
Tel +65-63101396 Fax +65-65154557  
E-mail salewin@singnet.com.sg  
URL www.winrigo.com.sg  
URL www.winrigo.com.sg  
URL www.winrigo.com.sg

Available in: Asia



R3plas Oxo-biodegradable Plastics packaging

EM-3-032

Natural materials

biodegradable films

Environment-friendly biodegradable film

Environmental performance

1. These biodegradable films are stable in the atmosphere but are decomposed by living microorganisms in compost, wet soil, and the sea.
2. As an environment mark accreditation product, it is an environment-friendly raw material that can convert into H<sub>2</sub>O and CO<sub>2</sub> upon complete dissolution by a soil microorganism after use.
3. These biodegradable films can be recycled several times in most conventional plastic processing equipment.

Product performance

- Garbage bags, food & drink garbage bags, shopping bags, luxury shopping bags, mulching film for agriculture, film for landscape architecture work
- Disposable gloves, disposable table cloths, roll bags

Korea UB Clean Co, Ltd.

459-11, Gilseong-ri, Hyangnam-myeon, Hwaseong-si, Gyeonggi-do, 445-921, Republic of Korea  
Tel +82-1600-1649 Fax +82-31-3599177  
E-mail ub@kubc.co.kr  
URL http://www.kubc.co.kr



Available in: Japan, Oceania, Europe, North America, Middle and Near East, Republic of Korea, China

## EM-3-033

## Natural materials

## nanocarbon

## Nanocarbon from woody biomass

## Environmental performance

- Reduction GHG and effective application of green resource
- Providing post-petroleum resources products
- Fixing carbon from atmosphere by using woody biomass as raw material.
- Improving CO<sub>2</sub> absorption of forests by proper thinning wood

## Product performance

- Nanocarbon is known as a great addition agent which can improve strength, conductivity and heat transfer of base materials such as plastic, ceramic and metal. Nanocarbon is also applied to an electrode of lithium battery. Toshiba has developed the nanocarbon production system, which use woody biomass as raw materials by applying pyrolysis technology.



Biomass Carbon

## TOSHIBA CORPORATION Social Infrastructure Systems Company

1-1, Shibaura 1-Chome, Minato-Ku, Tokyo, 105-8001, Japan  
Tel +81-3-3457-4204

## EM-3-034

## Natural materials

## tatami matting

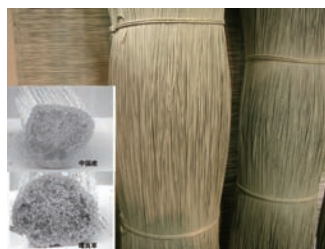
"Kanryoso<sup>®</sup>"; stronger skin rush

## Environmental performance

Rush is widely known as a material of "tatami" in Japanese housing. The features of "tatami" are not only the fragrance and strength, but also humidity control. In addition, it has been lately found that rush has a function of adsorbing chemical substances and of deodorizing. (Ex. NH<sub>3</sub> 99.3% CH<sub>3</sub>COOH 95.6%) The "Kanryoso<sup>®</sup>" rush has stronger skin compared with the previous rush, (ref., the photograph of electron-microscopy). This is a result of cultivation in which the intrinsic activity of rush has been fully leveraged. Every piece of the rush is thick and uniform.

## Product performance

Because of its strength the life of products made from "Kanryoso<sup>®</sup>" is long. Rush is a plant that grows by taking CO<sub>2</sub> into its body. Namely, the long-life "Kanryoso<sup>®</sup>" product fixes CO<sub>2</sub> for a longer period than conventional products. We are therefore contributing to the fixation of CO<sub>2</sub> by raising young rushes.



## IKEHIKO CORPORATION Co.,Ltd.

1052 Miyamatsu, Ooki-machi, Mizuma-gun, Fukuoka, 830-0424, Japan  
Tel +81-944-32-1203 Fax +81-944-33-1059  
URL <http://www.ikehiko.com>

Available in: Japan

KANRYOUSOU



EM-3-035

Natural materials

biomass fuel conversion

## Biomass Fuel Conversion: Palm Kernel Shells

## Environmental performance

ORIX offers proposals to customers to switch from using fossil fuels such as petroleum or heavy oil to biomass fuel. Fuel conversion enables customers to slash costs, stabilize fuel prices, reduce their environmental impact and contribute to a low carbon society. Japan is currently experiencing a shortage of biomass fuel in the form of wood chips and pellets from construction waste, and supplies are unstable. ORIX purchases and supplies biomass fuel produced overseas (Indonesian palm kernel shells).



## ORIX Corporation

12-15, Nihonbashi-kobunacho, Chuo-ku, Tokyo, 103-0024, Japan  
 Tel +81-3-6667-2271 Fax +81-3-3249-1985  
 URL <http://www.orix.co.jp/grp/>  
 URL [http://www.orix.co.jp/grp/eco\\_orix.htm](http://www.orix.co.jp/grp/eco_orix.htm)  
 URL <http://www.orix.co.jp/grp/co/environment/index.htm>



Palm kernel shells

## EM-4-001

## Foam

## biodegradable foam

## Environment-friendly biodegradable foam (regreen-foam)

## Environmental performance

It not only can substitute completely for existing styrofoam buffering material used for packaging but also can be used widely compared to styrofoam since it is produced by corn starch that is naturally obtained and does not generate static electricity.

Furthermore it is a good choice for export goods packaging as it meets environmental rules and regulations that many countries follow.

## Product performance

- Packaging for high-end electronic parts that are sensitive to a static electricity, ceramic ware, glass products, etc.
- Packaging for airmail, parcel post, personal belongings to be moved, mail-ordered products, and export goods packaging that requires biodegradability
- Breakage prevention against various chemicals and pharmaceuticals and dangerous articles, learning material for infants

## Korea UB Clean Co, Ltd.

459-11, Gilseong-ri, Hyangnam-myeon, Hwaseong-si, Gyeonggi-do, 445-921, Republic of Korea  
Tel +82-1600-1649 Fax +82-359-9177  
E-mail ub@kubc.co.kr  
URL www.kubc.co.kr

Available in: Japan, Oceania, Europe, North America, Middle and Near East, Republic of Korea, China



## EM-4-002

## Foam

## urethane insulation

## Non-fluorocarbon Urethane insulation

## Environmental performance

Bridgestone commercialized insulation material by applying non-Freon foaming technology and foam-on-spot spray technique. Rigid Urethane foam "everlight NFNR" is non-Freon with high insulation property, contributes to energy save by improving efficiency of air-condition. Comparison of LCA assessment between Freon and non-Freon insulation indicates non-Freon has less impact on global warm than Freon insulation 50 years after house built even Freon remained in it has been recycled and decomposed. Bridgestone won Environment Minister Prize of The 8th Ozon Preservation and Global Warm Prevention Prize in 2005 by this technique and LCA assessment.

## Product performance

- \* environment friendly non-Freon product (zero Ozon-depleting substance/global warm control)
- \* on-the-spot spray by existing foaming machine all seasons
- \* JIS class 3 flame retardant product
- \* low thermal conductivity/stable thermal insulation property

## Bridgestone Corporation

1-6-6, Yaesu, Chuo-ku, Tokyo, 103-0028, Japan  
Tel +81-3-5202-6830 Fax +81-3-5202-6833  
URL <http://www.bridgestone.co.jp/english/index.html>



Non-fluorocarbon Urethane insulation



EM-4-003

Foam

insulation material

## SOFTYCELL-ONE

## Environmental performance

Fluoro Carbon-free Rigid polyurethane foam for Spraying system energy-saving products with Heat Insulation in houses



## KURABO INDUSTRIES LTD.

4-31,2-chome,kyutaro-machi,choo-ku,osaka, Japan  
URL <http://www.kurabo.co.jp>



Available in: Japan

EM-4-004

Foam

phenolic foam insulation

## Freon-gas-free sophisticated high-performance phenolic foam insulation

## Environmental performance

The use of combustible hydrocarbon gas as a blowing agent and flame resistant property of the product are both accomplished by its unique foaming technology. It contributes to the prevention of the ozone layer and the mitigation of global warming by not using Freon gases. Furthermore, we realized high heat insulation performance, which is well over that of the conventional products (by 1.5-2 times). It is the product with long-lasting thermal resistance, significantly administering to high athermalize (energy-saving) of the structures.



## ASAHI KASEI CONSTRUCTION MATERIALS CORPORATION

1-105 Kanda Jinbocho,Chiyoda-ku,Tokyo, 101-8101, Japan  
Tel +81-3-3296-3529 Fax +81-3-3296-3535  
URL <http://www.asahikasei-kenzai.com>



Available in: Japan

## EM-5-001

## Ceramics and glass

steel bars

## Tow Sheet, maintenance and reinforcement material for concrete structures

## Environmental performance

Carbon-fiber sheet is affixed over the surface of concrete with resin adhesive. This work is easy and resists rust, thus contributing to the extended life of facilities and buildings.

## Product performance

As many highways are increasingly aged, maintenance and repairing work are in great demand to expand or extend the life of structures. The "Tow Sheet Method" supplied by Nippon Steel and Nippon Steel Composite is widely used in repairing and reinforcement work where "Tow Sheet" formed into sheet of carbon-fiber is affixed over the surface of concrete with resin adhesive. "Tow Sheet" work is easy and resists rust, thus contributing to the extended life of facilities and buildings. Nippon Steel looks forward to reducing the amount of construction waste and further to global environmental preservation through the promoted use of its "Tow Sheet".

## Nippon Steel Corporation

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Tel +81-3-6867-2566 Fax +81-3-6867-4999  
E-mail kankyo@nsc.co.jp  
URL <http://www.nsc.co.jp/en/eco/index.html>



## EM-5-002

## Ceramics and glass

fertilizers

## Soil improvement and planting material for highly acidic soil, "fA Zeolite"

## Environmental performance

fA Zeolite is a zeolite synthesized by a hydrothermal conversion between coal ash (a major industrial waste) and an alkaline aqueous solution. Coal ash provides a rich source of  $\text{SiO}_2$  and  $\text{Al}_2\text{O}_3$  as feedstock for zeolite synthesis. fA Zeolite also has the characteristics of activated carbon, which is produced by alkali activation of unburned carbon, and of ceramic due to the mullite it contains.

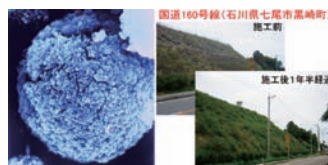
[Soil Improvement and Planting Material for Highly Acidic Soil]

fA Zeolite has the following effects, which serve to improve marine-clay-and-pyrite-containing highly acidic soil, with a pH level of 2 that is rapidly oxidized and sterilized when it is dug up during construction work, etc.:

- \* anti-proliferation against iron-oxidizing and sulfur-oxidizing bacteria.
- \* neutralization to improve the soil.
- \* absorption of soil-heavy-metal leached with a strong oxidant.
- \* rich in nutrients (CEC 200 cmol+/kg or over).
- \* afforestation of soil in barren areas with the product's water-retaining characteristic.

## HIKARIGAOKA CORPORATION

J.CITY 17FL 5-8-20, Takamatsu, Nerima-ku, Tokyo, 179-0075, Japan  
Tel +81-3-5372-4615 Fax +81-3-5372-4626  
URL <http://www.jcity-hikari.co.jp>  
URL <http://www.eco-spice.jp/>



Available in: Japan

Electron micrograph

EM-5-003

Ceramics and glass

glass

## Lead and arsenic-free optical glass (Eco-glass)

### Environmental performance

There are more than 100 types of optical glass, and in the past, generally, lead and arsenic have been used in most of them as constituents. However these two elements have high risks to cause the environment pollution.

So, Nikon has developed nearly full types of optical glass not containing these two elements, and has applied them to Nikon's optical products wholly.

### Product performance

Optical glass has, in general, high transmission, high homogeneity and optical constants, and is used for lenses or prisms of various types of optical products, for example, cameras, microscopes, etc.

In Nikon, optical glasses have been developed under cooperation with optical design division, and Nikon has established production technologies and mass-production structure based on Nikon's own glass production equipments. And, high quality of optical glasses produced by them have contributed to high performances of Nikon's products.

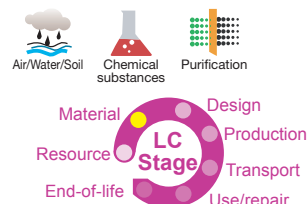
## NIKON CORPORATION

Fuji Bldg., 2-3, Marunouchi 3-chome, Chiyoda-ku, Tokyo, 100-8331, Japan

Tel +81-3-3214-5311

URL <http://nikon.com/>

URL <http://nikon.com/about/csr/report/index.htm>



Available in: Worldwide

Lenses and prisms made of Eco-glass

EM-5-004

Ceramics and glass

blast furnace cement

## P4246 High Slag Portland Blast Furnace Cement (HSPBFC) is a homogeneous blend of OPC and GGBS

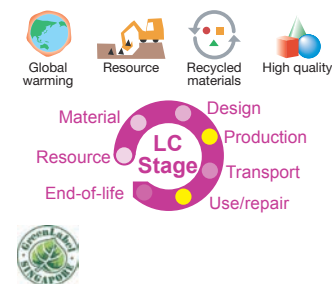
### Environmental performance

GGBS emits 20 times less CO<sub>2</sub> as compared to OPC. In P4246 HSPBFC, GGBS replaces a high percentage of OPC, up to 75%. GGBS replaces OPC, a material that contributes about 1 ton of CO<sub>2</sub> for each ton of OPC produced. By using more GGBS, it helps to conserve primary resources, reduce CO<sub>2</sub> emissions caused by OPC, and enhance a building's energy efficiency through mitigation of the heat island effect.

### Product performance

Key features of HSBFC

- 1) Good workability
  - 2) Prolonged slump retention
  - 3) Higher ultimate compressive strength
  - 4) Higher flexural strength
  - 5) More aesthetically pleasing appearance of lighter color in HSBFC concrete
- Key benefits of using HSPBFC
- 1) Reduces the risk of early-age thermal cracking especially in mass concreting
  - 2) Improves resistance to sulphate and chloride attacks on concrete, especially for marine structures
  - 3) Eliminates the risk of damage caused by alkali-silica reaction (ASR) in concrete
  - 4) Improves long-term strength development of concrete



## EnGro Corporation Ltd.

29 International Business Park, #08-05/06 Acer Building Tower B, 609923, Singapore

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E-mail [vincent.loh@engro-global.com](mailto:vincent.loh@engro-global.com)

URL [www.engro-global.com](http://www.engro-global.com)



EnGro's P4246 brand of HSPBFC is Green Label certified

EM-5-005

Ceramics and glass

ceramic bearing balls

## Long Life, High Reliability and Anticorrosion Minimize Environmental Impacts

### Environmental performance

- Mitigation of climate change: Reduction in the rotational energy loss of ball bearings.
- Efficient use of resources: Resource saving as a result of longer ball bearing life (5 times longer compared to steel bearing). Reduction in the waste of worn-out bearings because our ceramic bearings do not require frequent replacement.
- Management of chemicals: Environmentally beneficial reduction in the amount of bearing grease required.

### Product performance

- Maintenance saving: Easy maintenance thanks to a highly durable and reliable generator bearing system which is substantially free from electric corrosion because of its ceramic balls' good insulation property.



### Toshiba Materials Co., Ltd.

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 URL <http://www.toshiba.co.jp/index.htm>  
 URL <http://www.toshiba-tmat.co.jp/tmat/corp/env.htm>



Ceramic balls for windmill power generator bearings

EM-5-006

Ceramics and glass

carbon-fiber sheets for repairing

## Granulated Blast-Furnace Slag, Superior alternate material for clinker and cement

### Environmental performance

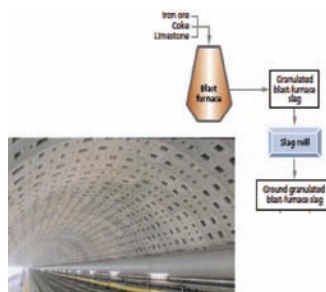
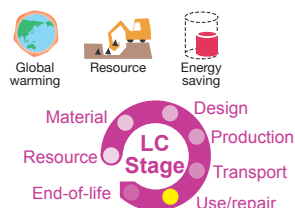
Reducing CO<sub>2</sub> emission about 40% compared with the ordinary cement producing.

### Product performance

The Granulated Blast-Furnace Slag ("GBFS") is produced by rapid granulation of molten slag that is obtained during the iron making process. GBFS primarily consists of CaO and SiO<sub>2</sub> together with minor chemical components. GBFS can be used as an alternate of clinker that is the raw material of cement. Especially, GBFS shows excellent hydration character when it is further ground, which is called Ground Granulated Blast-Furnace Slag ("GGBFS"). The character of GBFS or GGBFS has been widely known as an excellent alternate of clinker or cement. GBFS and GGBFS contributes to reduce CO<sub>2</sub> emission amount equal to 700Kg per each metric ton of GBFS or GGBFS through energy and natural resource saving during clinker burning process and cement production once GBFS or GGBFS are used instead of clinker and cement.

### Nippon Steel Corporation

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 E-mail [kankyo@nsc.co.jp](mailto:kankyo@nsc.co.jp)  
 URL <http://www.nsc.co.jp/en/eco/index.html>



Segments (GBFS, GGBFS are blended) of Trans Tokyo Bay Highway

## EM-5-007

## Ceramics and glass

ceramic, stone, and clay products

## Marine Block®

## Environmental performance

JFE has been developing restoration technologies for marine environments by utilizing steel slag, which is a byproduct of manufacturing. Porous Marine Block®, which is JFE's block product made from steel slag and CO<sub>2</sub> through a solidification reaction, has been adopted for coral reef restoration works in Sekisaishoko on a trial basis. So far, good results have been observed. Marine Block® has also been used in rejuvenation experiments for seaweed reefs close to Japan because of its excellent performance as an implantation base for seaweed.



Global warming



Purification



## JFE Steel Corporation

2-3, Uchisaiwai-cho 2-chome, Chiyoda-ku, Tokyo, 100-0011, Japan  
Tel +81-3-3597-3111 Fax +81-3-3597-4860  
URL <http://www.jfe-steel.co.jp/>

## EM-5-008

## Ceramics and glass

polycrystalline silicon

## Polycrystalline Silicon (Materials for solar power systems)

## Environmental performance

Global warming is an urgent issue not only for human beings but also any lives on the globe now. We are contributing to preservation and restoration of the natural environment on the earth by supplying polycrystalline silicon.

## Product performance

We are producing polycrystalline silicon for semiconductor and solar cell from metallurgical silicon by siemens process. The polycrystalline silicon for solar cells is a major raw material for photovoltaic industry and the energy generated from solar cells is clean without any generation of CO<sub>2</sub>.



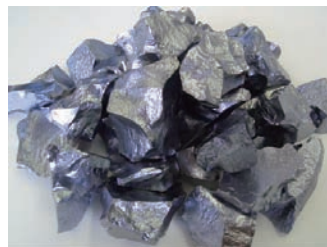
Global warming



Resource



Energy saving



## Mitsubishi Materials Corporation (Yokkaichi Plant)

5 Mita-cho, Yokkaichi, Mie, 510-0841, Japan  
Tel +81-59-345-5191 Fax +81-59-346-5815  
E-mail [toishii@mmc.co.jp](mailto:toishii@mmc.co.jp)  
URL <http://www.mmc.co.jp/corporate/en/index.html>  
URL <http://www.mmc.co.jp/corporate/en/product/electronics/1001.html>  
URL <http://www.mmc.co.jp/corporate/en/csr/csr.html>

Available in: Japan, Europe, Southeast Asia, U.S.A, China

Polycrystalline silicon

EM-5-009

Ceramics and glass

columnar-crystal large-diameter silicon

Columnar-crystal large-diameter silicon for solar cell and silicon parts

Environmental performance

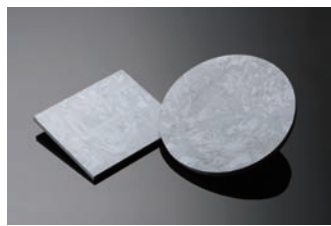
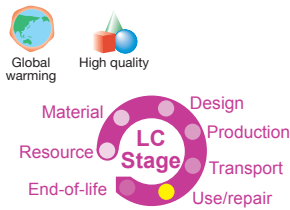
From the view-point of the global environmental problems, the product contributes to energy saving and CO<sub>2</sub> emission reduction as solar cells. Our product is superior in the efficiency of component manufacturing owing to its large diameter (square type: 1050×1050mm, circular type: Φ 1050). This reveals an environmentally low-load manufacturing process.

Product performance

The product is excellent in machining characteristics, mechanical strength, and chemical resistance, compared with the poly-crystal products prepared by other methods. Moreover, it has the performance at almost the same level as that of single crystal. It is therefore expected as a substitute in the field where the single crystal has been used. Since a large-diameter product can be made, the demand for columnar silicon crystal is rapidly increasing in fields where SiC, quartz and carbon have been used.

Mitsubishi Materials Electronic Chemicals Co.,Ltd.

3-1-6 Barajima, Akita City, Akita, 010-8585, Japan  
Tel +81-18-864-6011 Fax +81-18-864-4002  
URL <http://www.mmc.co.jp/corporate/en/product/electronics/1012.html>



Available in: Worldwide

Columnar Crystal Silicon of plate type



EM-6-001

Composites

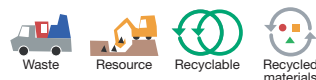
paving work

An Asphalt Pavement Material Utilizing The Shells of Scallop

Environmental performance

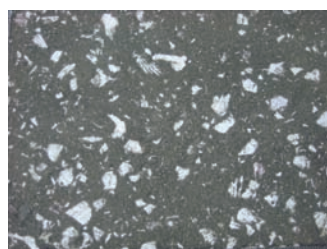
"Shell such as scallops" that worries to the processing is effectively used by an industrial by-product materials partially of the aggregate of the pavement material.

The shell is crushed to 20mm or less, and mixes with the hot asphalt mixture by 20~30% (weight ratio).



Watanabesato.co.ltd.

1-18-4 minamiazabu minatoku tokyoto, Japan



Available in: Japan

EM-6-002

Composites

flooring work

FireNo

Environmental performance

1. No release Formaldehyde.
2. No release 1,3-butadiene.
3. No release VOCs.

Product performance

FireNo is a superior fire-resisting product. it is suited to every public building interior materials, transprotation floor coverings, materials of industrial components etc.  
it prevents any fire from being out of control by using its excellent noninflammable and nontoxic efficiency.



Jin Sung Industrial Co

901-5,Goe-Dong,Nam-Gu,Pohang,Gyeong Buk, 790-300, Republic of Korea  
Tel +82-54-286-3100 Fax +82-54-271-3002  
E-mail kelly76com@paran.com  
URL www.jsrubber.co.kr  
URL www.jsrubber.co.kr



Available in: Worldwide, Republic of Korea

OPERATING IN KORAIL RAIL CAR

## EM-6-003

## Composites

## rubber-reforming materials

## Sulfron™ improves fuel consumption and enhances the durability of tires

## Environmental performance

Sulfron™ contributes to automobiles CO<sub>2</sub> reduction by a 5% improvement in fuel consumption.

## Product performance

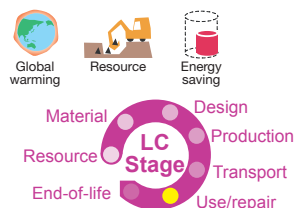
Sulfron™, a modified aramid derived from Twaron®, is a unique rubber ingredient that has been chemically processed from cut fiber. When absorbed by the tread of a tire, it disperses inside the rubber and as it conforms to the rubber, the tire becomes more durable. It also reduces rolling resistance, which improves fuel efficiency.

Performance of Sulfron:

1. Improves fuel consumption by 5%
2. Increases tire durability by suppressing heating while moving
3. Prevents tire tread cracking

## Teijin Aramid BV

Westervoortsedijk 73 P.O.Box 9600 6800 TC Arnhem, The Netherlands, 100-8585, Japan  
Tel +31-26-366-4396 Fax +31-26-366-4110  
E-mail k.kashiwagi@teijin.co.jp  
URL <http://www.teijinaramid.com/>



## EM-6-004

## Composites

## sawed and planed wood

## Raw material for environment-related recycled products, FREBO

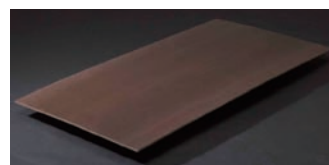
## Environmental performance

FREBO (Furukawa Recycle Ecology Board) is a recycled raw material produced by mixing waste woodchips from saw mills and disposed plastic raw material. It has the following features:

- (1) Environmentally-friendly newly-established standards JISA 5741 (combined material of recycled lumber and plastic) certificated
- (2) The amount of CO<sub>2</sub> emissions during manufacturing is 179 kg of CO<sub>2</sub>/t, a reduction of 20 - 30% compared with other wooden boards (220 - 250 kg of CO<sub>2</sub>/t).
- (3) Complete recycling is possible since the used products can be reproduced as raw material.
- (4) The amount of emitted formaldehyde has passed the F☆☆☆☆ standards, which is set on building-material boards (It should be 0.3 mg/l or less on average and 0.4 mg/l at a maximum).

## Product performance

- (1) Outstanding water resistance  
\* Water absorption rate: 5.0% \*1  
\* Thickness-expansion ratio by water absorption: 2.0% \*2
- (2) Excellent noise-barrier performance  
Compared with a particle board of the same thickness  
\* Reduction of floor-impact noise by roughly 2-4 dB with light-weight materials and by 1 dB with heavy-weight materials. \*3
- (3) Extremely tolerant against wear  
\* 0.05 g or below \*4  
<Test method>  
\*1: JISA5905-compatible  
\*2: JISA5908-compatible  
\*3: JISA1418-2  
\*4: JAS flooring standards



## FURUKAWA Co., Ltd.

884-61, Chuganji, Soeda-machi, Tagawa-gun, Fukuoka, Japan

Available in: Japan



## EM-6-005

## Composites

## reconstituted wood

## Recycled wood (Toppan Material Wood)

## Environmental performance

Toppan Material Wood is a recycled industrial material made entirely from waste and waste plastic. This industrial material can be re-crushed and recycled time and time again with no change in its original form and function.

## Product performance

High processability

Steady strength

High strength

Anti-bacillus corrosion

Water-proofing, weather resistant

"TOPPAN MATERIAL WOOD" is a product sold by Toppan Cosmo, Inc. that employs ECO-M-WOOD, a product for which ECOWOOD Co. Ltd. has acquired an Ecomark authorization number.

## TOPPAN COSMO, INC.

Toppan Shibaura Building, 26-19-3, Shibaura, Minato-ku, Tokyo, 108-8536, Japan

Tel +81-3-5418-3500 Fax +81-3-5418-3704

E-mail [eco@toppan.co.jp](mailto:eco@toppan.co.jp)

URL [http://www.toppan.co.jp/english/products\\_service/business/industrial/index.html](http://www.toppan.co.jp/english/products_service/business/industrial/index.html)

URL <http://www.toppan.co.jp/english/csr/>



Toppan Material Wood has high processability because it is made by extrusion.

## EM-6-006

## Composites

## adhesives

## Water-based Emulsion adhesive products with various foams "AH sheet"

## Environmental performance

Ever-light AH sheet is a kind of product combined with flexible urethane foam technique and the latest adhesion technique. It is a flexible high performance polyurethane sheet with adhesive on it. By using this sheet, it becomes easier to adhere requested foam with other substances. Conventional organic solvent product may cause air pollution and result in sickhouse syndrome. Instead of organic solvent, water is used to make AH sheet a water-based emulsion adhesive which is harmless. Removable Ever-light AH sheet for industrial use has been developed as well for the purpose of reuse of parts and release or separate of unnecessary parts.



## Bridgestone Corporation

1-6-6, Yaesu, Chuo-ku, Tokyo, 103-0028, Japan

Tel +81-3-5202-6830 Fax +81-3-5202-6833

URL <http://www.bridgestone.co.jp/english/index.html>



Water-based Emulsion adhesive products with various foams "AH sheet"

EM-6-007

Composites

adhesives

## Adhesive for interior decoration

## Environmental performance

- Environmentally friendly adhesive
- Plasticizer-free water based adhesive  
(Plasticizers are essentially VOC components, and such VOC components particularly in adhesives for use in housing are suspected to be causative substances for Sick House Syndrome.)

## Product performance

- Excellent bond strength and fast setting
- Good compatibility with urea resin
- Adaptable to spreading machines
- No contamination or damage to substrates and mechanical devices
- Adaptable to hot and cold press

## OKONG CORP.

621-7 Namchon-dong, Namdong-gu, Incheon, 405-846, Korea  
Tel +82-32-822-5050 Fax +82-32-817-5061  
E-mail okskjg@hanafos.com



EM-6-008

Composites

fiber materials

## Kyokawaraito

## Environmental performance

## \*Reduction of Waste

- (1) The total amount of clay-roof-tile waste caused by the dismantling of buildings reaches approximately 2 - 3 million tons a year in Japan, which is either reclaimed or discarded in the ocean
- (2) The clay-roof-tiles disposed of in Kyoto are crushed and controlled in size, then alien substances are removed before the product is processed into powder to realize 100% recycling. The recycled material is processed into yarn.
- (3) The more recycled, the more waste is cut.

## Product performance

Yarn, into which roof-tiles are kneaded, generates more far-infrared rays and negative ions than conventional yarn.

## Kokuyou CO.,Ltd

92-1 Miyanogo, Simomisu, Yokooji, Husimi, Kyotosi, Kyotofu, 573-0021, Japan  
Tel +81-756224417  
E-mail info@kokuyou.jp  
URL <http://www.kokuyou.jp>  
URL <http://www.kokuyou.jp/sogo.html>



EM-7-001

Others

polylactic acid

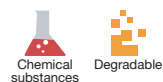
## PLA LID

### Environmental performance

- 100% biodegradable and compostable and environmentally friendly
- Harmless to the human body

### Product performance

- Coffee & fast food stores -Take out stores (Beverages, ice cream, etc)



## HANCHANG PAPER CO., LTD.

EXCON VENTURE BLDG., 15-24, YEOUIDO-DONG, YOUNGDEUNGPO-GU,  
SEOUL, 150-969, KOREA  
Tel +82-2-3774-5484 Fax +82-2-3774-5487  
E-mail wonchoong@hanchangpaper.co.kr  
URL www.hanchangpaper.co.kr



EM-7-002

Others

photo voltaic systems

## KRISTAL™ Multi-functional PV System

### Environmental performance

The durability of Kristal™ is enhanced by the use of UV-resistant, outdoor weather-proof polyurethane (PU) which is extensively used by the automotive industry. The molded frame enables different designs and components to be embedded and hence is easily customizable. The possibility of configuring a roof or facade meeting your unique requirements is highly achievable by Kristal™.

### Product performance

Enable your roof, facade, or wall to generate electricity, provide skylighting, and many more functions with our Kristal™ Multi-functional PV System. Grenzone Kristal™ Multi-functional PV System is a versatile customizable system that can be easily integrated for roofing, wall, or facade that has a different look and feel.









## Grenzone Pte Ltd.

Woodlands Spectrum 1, 2 Woodlands Sector 1, #05-14, 738068, Singapore  
Tel +65-6579-0560 Fax +65-6579-0561  
E-mail info@grenzone.com  
URL www.grenzone.com



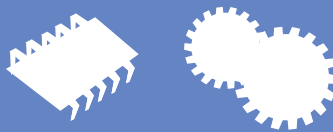
Available in: Worldwide

Kristal Multi-functional PV System

EM-7-003		Others
		structural clay products
<h3>FC powder</h3> <div><b>Environmental performance</b><p>FC-powder was made by recycling of validity resources (slug etc.) and it is used in hardening the soil or hardening the soft ground.</p><p>FC-powder looks like a general cement, but it is completely difference With cement in component.</p><p>FC-powder has no toxic,, So the hardening soil by FC-powder do not do harm to vegetation and finally return to natural soil not to make a industrial waste, compared with cement-structure.</p><p>The hardening soil by FC-powder is used in pavement of road for jogging, cycling &amp; stroll etc. and it is also used in making the Eco-block of ridge between rice fields in Korea.</p></div> <div><h4>FC Korea Land Co., Ltd</h4><p>Paradise1704Ho,159-6 Dongkyo-Dong, Mapo-Ku, Seoul, 121-816, Korea Tel +822-3141-1174 Fax +822-3141-1175 E-mail fc4u@paran.com URL www.fc4u.co.kr</p></div>		<div><div><div><div><p>Air/Water/Soil</p></div><div><p>Recycled materials</p></div></div><div><p>Material Resource End-of-life Design Production Transport Use/repair</p></div><div><div></div></div></div><div></div></div>
Available in: Worldwide		



# Eco-components



- 1 Construction components**
- 2 Electrical and electronic components**
- 3 Semiconductor-related devices and components**
- 4 Machine parts**
- 5 Automobile parts**
- 6 Packaging**
- 7 Others**

In the *Eco-products Directory 2010*, “eco-components” refer to “environment-friendly components and functional parts assembled using such components.” Eco-components include components that have only low environmental impact when manufactured and components that enable finished (assembled) products to help reduce environmental impact. For example, vacuum insulation materials can be used in refrigerators to achieve energy savings. Components are often called “half-finished products” relative to “finished products,” i.e., many are used in finished products.

As for eco-materials, environmental impact reduction throughout the life cycle is a key point for eco-components. Hence, the six criteria under the definition of eco-materials (see the page titled “Eco-materials” in the directory) also partly apply to eco-components. For example, when eco-components can provide “high performance when used,” they can increase the energy saved by finished products. The reuse of components as functional parts is a good example of “high recyclability.” It should be noted, however, that various requirements must be met prior to the reuse of used components, e.g., in terms of long life, quality, and reliability.



## EC-1-001

## Construction

## solar lighting systems

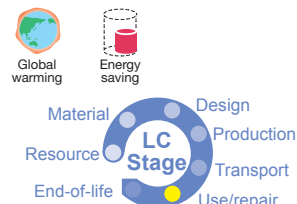
## Solar Wave Setting Footstool for PV Systems

## Environmental performance

Effective use of space under PV system

Possible locations to be adopted

- \* Arcade
- \* Roof on department store
- \* Parking Space



## Green Tec Co.,Ltd

539 Yamabushiyama-cho, Nishikikoji-agaru, Muromachi-dori, Nakagyo-ku,  
Kyoto, Japan  
Tel +81-75-548-7077 Fax +81-75-213-3442  
E-mail [info@greentec-group.co.jp](mailto:info@greentec-group.co.jp)  
URL <http://www.greentec-group.co.jp/english>  
URL [http://www.greentec-group.co.jp/images/english/top/solarwave\\_eng.pdf](http://www.greentec-group.co.jp/images/english/top/solarwave_eng.pdf)



Available in: Worldwide

Solar Wave Setting Footstool for PV Ssystems

## EC-1-002

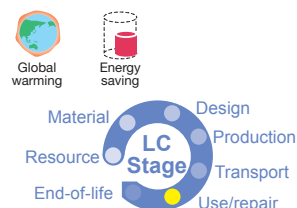
## Construction

## paints

## Building Exterior Paint Invented with Energy Conservation in Mind "MIRACOO"

## Environmental performance

Coating with "Miracool" reflects about 90% of sunlight, which curbs the temperature increases in building walls and roofs. In addition, it drastically reduces the quantity of heat transmission owing to its low coefficient of thermal conductivity and high long-wave emissivity. Because of these functions, "Miracool" can contribute to energy conservation by reducing a building's cooling load. Not only for the energy conservation of a building itself, it can also be helpful for mitigating the heat island phenomenon, extraordinary high temperatures in urban areas as a whole, as it is able to control the absorption of solar energy. We can provide "Miracool way" for asphalt-paved roads, other than "Miracool" for buildings.



## MIRACOO Co., Ltd.

1-11-15-4F, Nihonbashi-horidomecho, Chuo-ku, Tokyo, 103-0012, Japan  
Tel +81-3-3249-0272 Fax +81-3-3249-0270  
E-mail [info@miracool.jp](mailto:info@miracool.jp)  
URL <http://www.miracool.jp>



Miracool



## EC-1-003

## Construction

## paints

## Shirasu Balloon Paint - saves energy using the properties of shirasu (volcanic ash sediment) , a natural material from Kagoshima

## Environmental performance

Shirasu Balloon Paint features multiple levels of thermal conductivity and solar reflectance that enhance its heat-shielding and insulation properties. Coating roofs and walls with this paint reduces the temperatures of surfaces and their reverse sides by 20 and 10 - 15°C, respectively, enabling the maintenance of a comfortable indoor environment throughout the year and helping to reduce air-conditioning costs as well as CO<sub>2</sub> emissions. Its heat-shield performance has been confirmed in test construction as well as by its use in the field, and calculation examples of its heat shield and insulation effects can also be shown based on figures relating to heat-shield performance, such as heat conductivity and solar reflectance. The product has passed a test involving 3,000 hours of accelerated weathering using a xenon lamp (representing 10 years of weathering).

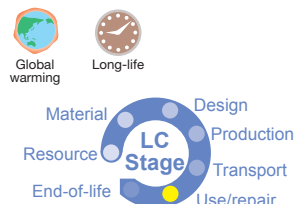
## Product performance

Shirasu Balloon Paint is a water-based substance that uses no paint thinner, and is produced by processing Shirasu - a material produced throughout Kagoshima Prefecture - into Shirasu balloons (hollow bodies). The paint shields and insulates against heat, making it friendly to people, the environment, and buildings. It can also be applied to helmets and sheets as well as buildings to take advantage of its characteristics. In addition to the paint itself, the manufacturer also offers a product called Shirasu Wall - an interior/exterior finishing material with the same properties as Shirasu-based paint that requires no maintenance for a period of 20 years. This product won the 2007 Minister of the Environment Award for Global Warming Mitigation Activities in the Category of Mitigation Technology Introduction and Dissemination.

## EARTH KAKEN Corporation

2052 MIYAZAKI CYOU SATSUMASENDAI-CITY KAGOSHIMA, 895-0013, Japan

Available in: Japan



## EC-1-004

## Construction

## wall materials

## "Air-nice," a Plastered Wall Material using Rush and Natural Materials

## Environmental performance

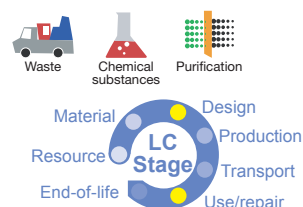
Rush is used in Japanese housing as "tatami," which is known to help with humidity control. In general, until the completed "tatami" mat is woven up, one-third of the rush is emitted as waste. Recently, it has been proven that "tatami" adsorbs chemical substances such as NO<sub>2</sub> and HCHO. (Ex.NO<sub>2</sub>99.5% absorb) With this in mind, we pulverized the waste, of rush mixed with natural materials and made a plastered wall material as a commercial product. Completed was a wall material that gives a warm atmosphere which is not felt from usual plaster and diatomaceous earth.

## Product performance

The new product regulates the indoor environment by humidity control and adsorption, and restrains the emission of CO<sub>2</sub> by preventing the incineration of waste. As for air-tight houses, the influence of chemical substances on the human body is a serious matter. By using the rush wall-material, we can improve living conditions.

## IKEHIKO CORPORATION Co.,Ltd.

1052 Miyamatsu, Ooki-machi, Mizuma-gun, Fukuoka, 830-0424, Japan  
Tel +81-944-32-1203 Fax +81-944-33-1059  
URL <http://www.ikehiko.com>



Available in: Japan

RushFiberWallMaterial "KUUKIYOI"

## EC-1-005

## Construction

board

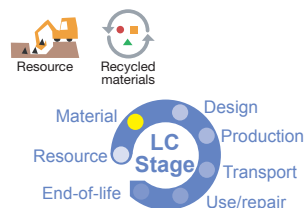
## Akita Hard Cedar Board

## Environmental performance

Waste pieces of ceiling material made of Akita cedar are fixed to the surfaces of the boards. The core of the boards is thinned Akita cedar.

## Product performance

Coating the soft Akita cedar with resin makes the surface of the boards harder. The product is available for desks in schools as well as top boards of various kinds of tables.



## 秋田杉天板納入事例写真

秋田県認定 リサイクル製品



株式会社 ツルタ http://www.tsuruta.co.jp  
電話 0182-32-0220

## TSURUTAC

10-4 Kiyokawa-cho, Yokote, Akita, 013-0032, Japan  
Tel +81-182-32-0220 Fax +81-182-32-0224  
E-mail [tsuruya@po.tsuruta.co.jp](mailto:tsuruya@po.tsuruta.co.jp)  
URL <http://www.tsuruta.co.jp>

Available in: Japan

## EC-1-006

## Construction

heat insulating films

Reftel<sup>®</sup>, Highly Transparent, Heat Insulating Film

## Environmental performance

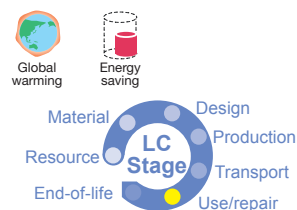
Reftel<sup>®</sup> contributes to the energy conservation of air conditioning by intercepting the heat rays entering indoors from windows.

## Product performance

Reftel<sup>®</sup> is the world's first highly transparent and heat reflective insulating film developed by Teijin.

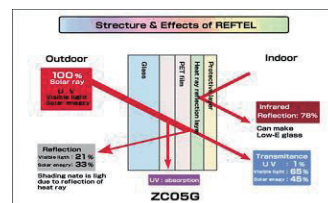
It is made by coating Teijin's polyester (PET) film with ultra thin metal layers using a sputtering method. It has a selective heat and light transmittance, and gives higher transparency, higher heat shielding and better durability compared with aluminum vapor deposited films, colored films or IR (Infrared) absorbing films. It is hardly noticeable when it is installed on a glass window because it has a 60 to 80% transmittance of visible light.

There are a variety of grades which have different visible light transmittance to meet any requirement. It has high infrared reflectivity and thus yields high energy saving effectiveness.



## N.I. TEIJIN SHOJI CO.,LTD.

Sumitomo Fudosan Shibadaimon Bldg, 5-5, Shibadaimon 2-chome, Minato-ku, Tokyo, 105-0012, Japan  
Tel +81-3-6402-7006 Fax +81-3-6402-7071  
E-mail [tshinguu11134@ni-teijinshoji.co.jp](mailto:tshinguu11134@ni-teijinshoji.co.jp)  
URL <http://www.teijin.co.jp/english/index.html>  
URL <http://www.teijin.co.jp/english/about/reftel/>

Structure and effect of Reftel<sup>®</sup> (Type ZC05G)

## EC-2-001

## Electrical and electronic

## color filters

## Color filter (BM made of organic resin)

## Environmental performance

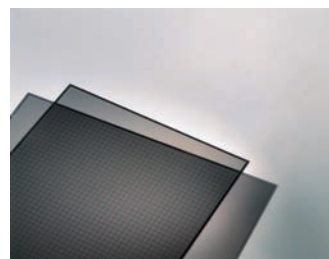
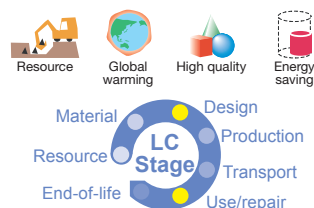
To improve light transmission that contributes to saving electric power for liquid crystal display panels (LCDs), the width of the color filter's black matrix (BM) is formed narrower than before.

In addition, more environmentally friendly materials, resin, is used instead of chrome which has been widely used as BM material.

## Product performance

Color filters are key components of color LCD panels and consist of primary three-color patterns of RGB.

In the process of manufacturing them, it is necessary to form BM first on a glass substrate in order to prevent unnecessary leakage of light through patterns.



## TOPPAN PRINTING CO., LTD.

1, Kanda Izumi-cho, Chiyoda-ku, Tokyo, 101-0024, Japan  
 Tel +81-3-3835-5549 Fax +81-3-3835-0847  
 E-mail [eco@toppan.co.jp](mailto:eco@toppan.co.jp)  
 URL <http://www.toppan.co.jp/english/>  
 URL <http://www.toppan.co.jp/english/csr/>

## EC-2-002

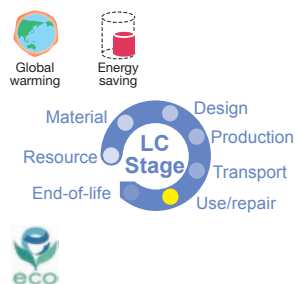
## Electrical and electronic

## wire cables

## Inverter surge resistant enameled wire "KMKED"

## Environmental performance

- "KMKED" has an insulation film that is hardly eroded by inverter surges.
- "KMKED" also provides much higher mechanical strength than existing products.
- These features contribute to the longer life of motors.



## Hitachi Cable, Ltd.

Hitaka Works, 5-1-1 Hitaka-cho, Hitachi-shi, Ibaraki, 319-1414, Japan  
 Tel +81-294-25-3835 Fax +81-294-43-3852  
 E-mail [taketani.noriaki@hitachi-cable.co.jp](mailto:taketani.noriaki@hitachi-cable.co.jp)  
 URL <http://www.hitachi-cable.co.jp/en/index.html>  
 URL <http://www.hitachi-cable.co.jp/en/products/cable/magnetwire/index.html>  
 URL <http://www.hitachi-cable.co.jp/en/about/publish/csr/index.html>



Cross section of wire after voltage endurance test (1.1kVp-11.2h)

EC-2-003

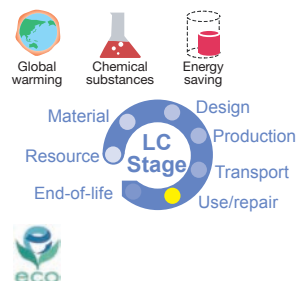
Electrical and electronic

wire cables

## Solder Coated Copper Wire for Solar Cells

## Environmental performance

- Lead Free and comply with RoHS directive.
- Contribution to energy conservation by offering various conductors specific to usages and needs.
- Stress caused by connection has been decreased using super-soft annealing copper wire that is suitable for thin type Si cells.



## Hitachi Cable, Ltd.

Hitaka Works, 5-1-1 Hitaka-cho, Hitachi-shi, Ibaraki, 319-1414, Japan  
 Tel +81-294-25-3835 Fax +81-294-43-3852  
 E-mail [taketani.noriaki@hitachi-cable.co.jp](mailto:taketani.noriaki@hitachi-cable.co.jp)  
 URL <http://www.hitachi-cable.co.jp/en/index.html>  
 URL <http://www.hitachi-cable.co.jp/en/about/publish/csr/index.html>



Solder coated copper wire for solar cells

EC-2-004

Electrical and electronic

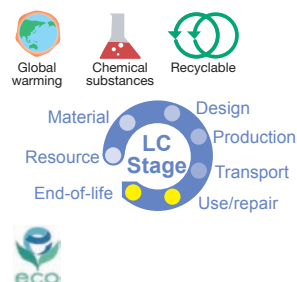
wire cables

## ECOGREEN® Environment-conscious type

## Environmental performance

- A recycling system of waste electric wires is established.
- There is no dioxin emission when incinerating and no harmful substance when buried underground.
- The amount of material used is reduced and the amount of waste is also small.
- Halogen gas is not generated and less smoking occurs in case of fire.

\* ECOGREEN® is registered trademark of Hitachi Cable, Ltd.



## Hitachi Cable, Ltd.

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 Tel +81-294-25-3835 Fax +81-294-43-3852  
 E-mail [taketani.noriaki@hitachi-cable.co.jp](mailto:taketani.noriaki@hitachi-cable.co.jp)  
 URL <http://www.hitachi-cable.co.jp/en/index.html>  
 URL <http://www.hitachi-cable.co.jp/en/products/cable/index.html>  
 URL <http://www.hitachi-cable.co.jp/en/about/publish/csr/index.html>



ECOGREEN® Environment-conscious type

EC-2-005

Electrical and electronic

wire cables

## Self-lubrication enameled wire "KOMAKI®" for higher space factor

## Environmental performance

- "KOMAKI® Series" of enameled wires provide a coil with high space factor, and so meets the demand for high-efficiency compact motors while conserving energy.
- "KOMAKI" wires deliver much stronger bonding strength with impregnating varnish compared to existing self-lubricated enameled wires.

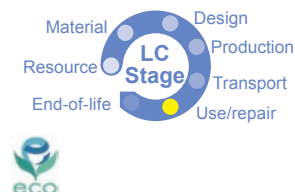
\* KOMAKI® is registered trademark of Hitachi Cable, Ltd. in Japan.



Global warming



Energy saving



## Hitachi Cable, Ltd.

Hitaka Works, 5-1-1 Hitaka-cho, Hitachi-shi, Ibaraki, 319-1414, Japan

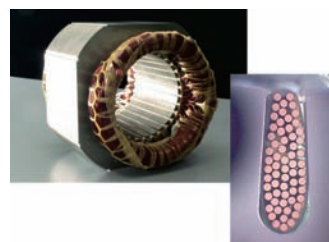
Tel +81-294-25-3835 Fax +81-294-43-3852

E-mail [taketani.noriaki@hitachi-cable.co.jp](mailto:taketani.noriaki@hitachi-cable.co.jp)

URL <http://www.hitachi-cable.co.jp/en/index.html>

URL <http://www.hitachi-cable.co.jp/en/products/cable/magnetwire/index.html>

URL <http://www.hitachi-cable.co.jp/en/about/publish/csr/index.html>



Stator of high efficiency motor that used "KOMAKI®"

EC-2-006

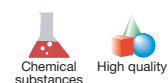
Electrical and electronic

audio cables

## High-end audio cable, HDMI cable, interconnect cable

## Environmental performance

For long time usage, with high quality and fantastic design to decorate your home entertainment equipment.



Chemical substances



High quality



## Varo Technology Co., Ltd.

11F-4, No. 27, Sec. 3, Chung Shan N. Road, Taipei, Taiwan, R.O.C.



EC-2-007

Electrical and electronic

fixed capacitors

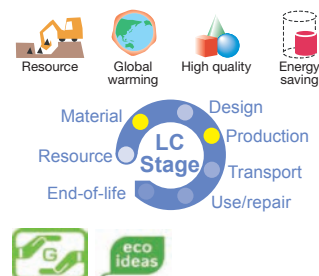
## Resonance circuit for Power Supply Metallized Polypropylene Film Capacitors

## Environmental performance

This product achieves resource saving by downsizing. It achieves 40% in volume and 45% in mass compared with our conventional product (0.022  $\mu$ F product). This product also reduces energy consumption in production process to 27%.

## Product performance

This product does not only achieve small size and high current by new processes but also the industry's smallest buzz, high level of safety.



## Panasonic Electronic Devices Co.,Ltd.

1006 Kadoma Kadoma City Osaka, 571-8506, Japan  
 Tel +81-6-6907-4781 Fax +81-6-6907-4799  
 URL <http://panasonic.co.jp/ped/>  
 URL <http://panasonic.co.jp/ped/products/index.html>  
 URL <http://panasonic.co.jp/ped/environment/index.html>



Available in: Japan

Metallized Polypropylene Film Capacitors (Parts No. ECWH8473HA)

EC-2-008

Electrical and electronic

capacitor

## Electric Double Layer Capacitor, DLCAP™

## Environmental performance

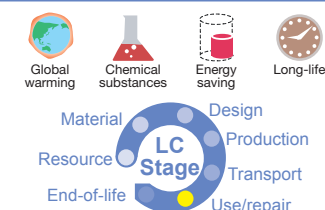
Nippon Chemi-Con's electric double layer capacitor, DLCAP™, is possible to charge-discharge large current, having longer cycle life compared to ordinary secondary batteries. It is expected to be used for vehicle hybrid system, regarding energy saving.

## -Characteristics-

- With low degradation, multimillion cycles of charge-discharge is possible.
- With a high power density, rapid (high current) charge-discharge is possible.
- With a high charge-discharge efficiency, an output efficiency of over 95% at 1kW/kg is obtained.
- Environmentally friendly without using heavy metal for its structure material.
- High in safety during abnormal time, and no malfunction occurs due to short circulation.

## Product performance

- Capacitance: 350 to 3,200F
  - Low Internal Resistance: from 0.8mOhm
  - Temperature Performance : -25°C to 60°C
- \*-40°C to 85°C is under development



## Nippon Chemi-Con Corporation

5-6-4, Osaki, Shinagawa-ku, Tokyo, 151-8604, Japan  
 Tel +81-3-5436-7836 Fax +81-3-5436-7864  
 URL <http://www.chemi-con.co.jp/e/index.html>  
 URL <http://www.chemi-con.co.jp/e/catalog/index.html>  
 URL <http://www.chemi-con.co.jp/e/env/index.html>



Available in: Worldwide

Electric Double Layer Capacitor, "DLCAP™"



EC-2-009

Electrical and electronic  
composite parts

## The industry's smallest size "ESD Suppressor Array"

## Environmental performance

Our company has a selection of "ESD suppressors \*1" which achieves excellent quality of transmission with low capacitance.

The industry's smallest size "ESD Suppressor Array" with 4 built-in ESD suppressors is commercialized this time.

Due to this, it contributes reduction in the number of parts for the countermeasure against static electricity of high-speed signal line.

\*1 Electrostatic Discharge Suppressor:  
(Device suppressing overvoltage generated from electrostatic discharge)

## Product performance

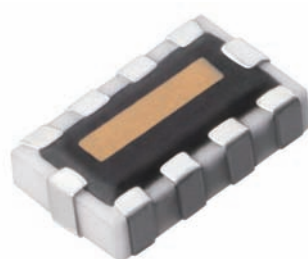
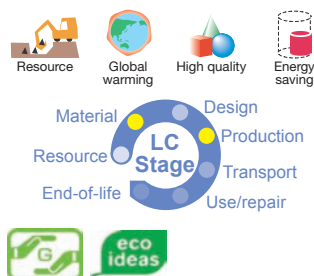
The type of this product is with 4 built-in ESD protecting circuits and is suitable for ESD suppression part for the high-speed transmission line. The features are as follow.

- (1) Low capacitance (0.25pF)
- (2) Good ESD suppression characteristics
- (3) Good ESD withstanding

## Panasonic Electronic Devices Co.,Ltd.

1006 Kadoma Kadoma City Osaka, 571-8506, Japan  
Tel +81-6-6907-4781 Fax +81-6-6907-4799  
URL <http://panasonic.co.jp/ped/>  
URL <http://panasonic.co.jp/ped/products/index.html>  
URL <http://panasonic.co.jp/ped/environment/index.html>

Available in: Japan, Europe, North America, Malaysia



ESD Suppressor Array

EC-2-010

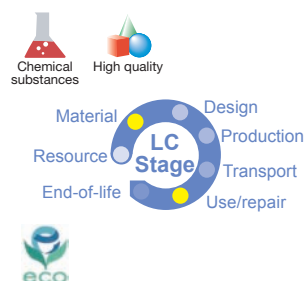
Electrical and electronic  
soft magnetic parts

## EMC Noise Reduction Products

## Environmental performance

While IT and electronics devices continue to become smaller and achieve greater performance as well as increased functionality, EMC regulations are becoming even more stringent. In this situation, electronics manufacturers require materials and components with high EMC noise suppression capabilities. Hitachi Metals offers its "FINEMET®" series" of nanocrystalline soft magnetic materials for high-performance EMC noise reduction. These products are lead-free and RoHS compliant.

EMC: Electro-Magnetic Compatibility



## Hitachi Metals Singapore Pte. Ltd.

12 Gul Avenue, 629656, Singapore  
Tel +65-6861-7711  
E-mail [hmcc@hitachi-metals.co.jp](mailto:hmcc@hitachi-metals.co.jp)  
URL <http://www.hitachi-metals.co.jp/e/index.html>  
URL [http://www.hitachi-metals.co.jp/e/prod/prod02/p02\\_22.html](http://www.hitachi-metals.co.jp/e/prod/prod02/p02_22.html)  
URL [http://www.hitachi-metals.co.jp/e/corp/corp14\\_01.html](http://www.hitachi-metals.co.jp/e/corp/corp14_01.html)

Available in: Worldwide



EMC Noise Reduction Products

## EC-2-011

## Electrical and electronic

## electric contacts

## Environment-friendly cadmium-free electric contact

## Environmental performance

## (Features)

This product is a high-reliability cadmium-free electric contact, which is excellent in welding resistance and consumption resistance. These electric contacts provide relays and switches with longer life and higher capacity, also making them much smaller in size. This product complies with the EU RoHS directive.

## Product performance

## (Uses)

They have been widely used in relays, switches, magnetic contactors, circuit breakers and circuit protectors in on-vehicle electrical components, home appliances, power distribution apparatus, switchboards and others. They are also widely adopted in hybrid cars making them suitable for high voltage power systems.

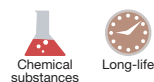
## Mitsubishi Materials C.M.I. Corporation

46-1 Sempuku, Susono City, Shizuoka, 410-1116, Japan

Tel +81-55-992-6111 Fax +81-55-992-6137

URL <http://group.mmc.co.jp/cmi/en/index.html>

URL <http://group.mmc.co.jp/cmi/en/0102.html>



Cadmium-free electric contacts

## EC-2-012

## Electrical and electronic

## secondary batteries

## NAS battery systems

## Environmental performance

The NAS battery is an energy storage battery that uses sodium in the negative electrode, sulfur in the positive electrode, and solid electrolyte made from beta-alumina ceramics. It is a clean battery that has high energy density, high efficiency, and long life compared to a lead-acid battery. This technology is primarily being introduced into factories, office buildings and sewage treatment facilities that wish to economize their energy cost through load leveling, and into semiconductor plants and customers that need high-quality and highly reliable electric power.



## Tokyo Electric Power Company

1-1-3 Uchisaiwai-cho, Chiyoda-ku, Tokyo, 100-8560, Japan

Tel +81-3-6373-1111 Fax +81-3-3596-8520

URL <http://www.tepco.co.jp/en/index-e.html>

URL <http://www.tepco.co.jp/en/challenge/environ/report-e.html>



Available in: Japan

NAS battery system



## EC-2-013

## Electrical and electronic

## rechargeable batteries

Innovative rechargeable battery with a long life of 6,000 charge-discharge cycles and rechargeable in 5 minutes.

## Environmental performance

- Mitigation of climate change: Battery for eco products, such as electric bicycles, electric motor bikes, and HEV (Hybrid Electric Vehicle).
- Efficient use of resources: A long life of 6,000 charge-discharge cycles leads to a reduction of waste.

## Product performance

- Safety: Excellent safety thanks to a structure resistant to internal short circuiting and thermal runaway.
- Long life: Capacity loss after 6,000 charge-discharge cycles is less than 10%.
- Rapid charging: Rapid charging in 5 minutes (up to 90%) at cell level.



## TOSHIBA CORPORATION Transmission Distribution &amp; Industrial Systems Company

1-1, Shibaura 1-Chome, Minato-Ku, Tokyo, 105-8001, Japan

URL <http://www.toshiba.co.jp/index.htm>URL <http://www.scib.jp/en/index.htm>URL <http://www.toshiba.co.jp/env/en/report/index.htm>

Available in: Japan

SCiB™, Rechargeable Battery TBP series (battery module)

## EC-2-014

## Electrical and electronic

## laser

## LUMICUBE FREQUENCY DOUBLED DIODE LASER (RoHS Compliant)

## Environmental performance

LUMICUBE is a frequency doubled diode laser for built-in applications that covers the 480 nm to 530 nm optical wavelength range of an argon ion laser. It incorporates Shimadzu's QPM component to offer high optical conversion efficiency and high reliability.

Its compact size, single power-supply operation (+12 V DC), low power consumption, and low heat generation make LUMICUBE ideal for installation in products.

Shimadzu's unique self-tuning and auto power control functions maintain excellent beam quality over a wide temperature range from 15 to 45 degrees.

- (1) Unique QPM (quasi-phase-matching) component achieves high beam quality.
- (2) Shimadzu digital control technology achieves superb power stability over a wide temperature range from 15 to 45 degrees.
- (3) Compact and highly reliable laser head
- (4) Low power consumption and low heat generation
- (5) Covers various wavelength ranges.



## SHIMADZU CORPORATION

1, Nishinokyo-Kuabaraicho, Nakagyo-ku, Kyoto, 604-8511, Japan

Tel +81-75-823-1113 Fax +81-75-823-2062

URL <http://www.shimadzu.com/index.html>URL <http://www.shimadzu.com/products/opt/index.html>URL <http://www.shimadzu.com/about/environmental/index.html>

Available in: Worldwide

## EC-2-015

## Electrical and electronic

## toroidal mirror

## Toroidal Mirror TR Series

## Environmental performance

A toroidal mirror is an aspheric mirror with a different curvature in the vertical and horizontal directions. As it can focus light diverging from a point source to approximately a single point under specific off-axis conditions, it can form an efficient optical system and reduce the size of optical component. The TR Series meets the requirements restricting the use of hazardous substances in EU Directive 2002/95/EC. These products can be used to configure highly energy-efficient and compact optical systems, making them suitable optical elements for ecoproducts.

The Shimadzu toroidal mirrors TR Series offer the following features:

- (1) Precision-polish optical glass offers high surface accuracy and low surface roughness.
- (2) Shimadzu's unique aluminum coating technology offers high reflectance in the UV region
- (3) RoHS Compliant product

## SHIMADZU CORPORATION

1, Nishinokyo-Kuwabaracho, Nakagyo-ku, Kyoto, 604-8511, Japan

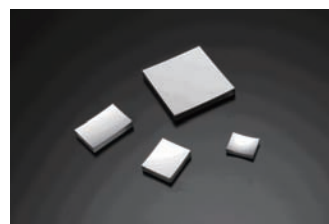
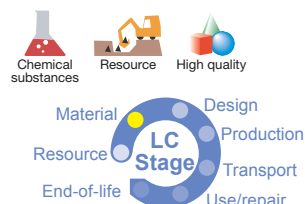
Tel +81-75-823-1113 Fax +81-75-823-2062

URL <http://www.shimadzu.com/index.html>

URL <http://www.shimadzu.com/products/opt/off/5iqj1d0000002ws5.html>

URL <http://www.shimadzu.com/about/environmental/index.html>

Available in: Worldwide



Shimadzu toroidal mirrors: TR Series

## EC-2-016

## Electrical and electronic

## beamsplitters

## Polka-Dot Beamsplitters

## Environmental performance

A polka-dot beamsplitter has a polka-dot pattern aluminum coated onto a glass substrate. Incident light is reflected from the coated areas but is transmitted through the uncoated areas. Unlike a conventional dielectric beamsplitter, the light split ratio is almost independent of the angle of incidence.

These polka-dot beamsplitters meet the requirements restricting the use of hazardous substances in EU Directive 2002/95/EC. As a single polka-dot beamsplitter covers a broad wavelength range, the number of optical elements in an optical component can be reduced to contribute to space-savings and more efficient use of resources.

The polka-dot beamsplitter offers the following features:

- (1) Wide wavelength range (UV to IR)
- (2) Low dependence on angle of incidence
- (3) Two models available: standard type (to 2200 nm) and high-grade type (to 3200 nm)
- (4) RoHS Compliant product

## SHIMADZU CORPORATION

1, Nishinokyo-Kuwabaracho, Nakagyo-ku, Kyoto, 604-8511, Japan

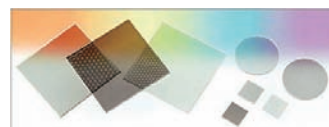
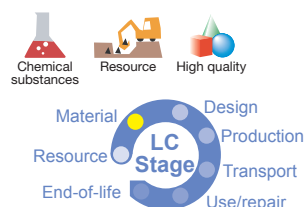
Tel +81-75-823-1113 Fax +81-75-823-2062

URL <http://www.shimadzu.com/index.html>

URL <http://www.shimadzu.com/products/opt/polka/index.html>

URL <http://www.shimadzu.com/about/environmental/index.html>

Available in: Worldwide



Polka-dot beamsplitters

## EC-2-017

## Electrical and electronic

## lighting

## Energy efficient DC lamps

## Environmental performance

Phocos is one of the largest suppliers of off-grid power supply system components in the world. Headquartered in Ulm, Germany, Phocos develops, designs, and manufactures products to suit the needs of all stake-holders in the global solar power market.

Phocos is strongly committed to developing and producing products that meet the company's strict specifications in terms of quality, innovation, and technology.

Besides the comprehensive range of solar charge controllers, Phocos is offering quality 12/24 V DC lamps that have very high illumination efficiency at low power consumption. Our DC lamps have a life span of over 8,000 hours at 25 degrees C ambient temperature, with more than 500,000 switching cycles (IEC925).

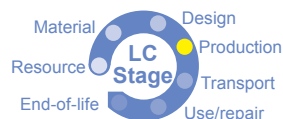
## Product performance

For Phocos 11W DC Lamps, an average luminous efficacy is 63lm/W for Warm Light and 61lm/W for Cool Light. The equivalent brightness compared to a standard incandescent lamp is 65W.

## Phocos SEA Pte Ltd.

Woodlands Spectrum 1, 2 Woodlands Sector 1, #05-14, 738068, Singapore  
Tel +65-6579-0598 Fax +65-6579-0599  
E-mail [info-sea@phocos.com](mailto:info-sea@phocos.com)  
URL [www.phocos.com](http://www.phocos.com)

Available in: Worldwide



Phocos DC Lamps

## EC-2-018

## Electrical and electronic

## button batteries

## Mercury-free alkaline button battery (LR)

## Environmental performance

With conventional alkaline button batteries, mercury was added to the anode material in order to prevent the occurrence of Hydrogen gas. Furthermore, as the cathode material used in these batteries was known to have a low rate of Hydrogen gas absorption, making the creation of a totally mercury-free alkaline button battery a significant technological challenge.

The mercury-free alkaline button battery incorporates proprietary Sony technology that mixes absorbent raw material into the cathode for the first time. By combining this with existing technology that prevents Hydrogen gas occurrence on the anode (which Sony originally adopted in its mercury-free silver oxide (SR) button batteries), Sony has succeeded in eliminating the use of mercury in this new batteries.

## Sony Corporation

1-7-1 Konan, Minato-ku, Tokyo, 108-0075, Japan  
URL <http://www.sony.net/eco/>  
URL <http://www.sony.com/>  
URL <http://www.sony.net/SonyInfo/csr/environment/>



Mercury-free alkaline button battery: LR44-ECO

## EC-2-019

## Electrical and electronic

## button batteries

## Zero Mercury and Zero Lead Added Silver Oxide Battery

## Environmental performance

Zero mercury and zero lead added.

Conventional Silver Oxide Batteries have a small but non-negligible amount of mercury and lead added to the anodal zinc to prevent emission of gasses.

Through the development of original zinc corrosion prevention technologies, Maxell has eliminated the use of mercury and lead. This initiative to reduce environmental impact has drawn enthusiastic acclaim from outside the company.

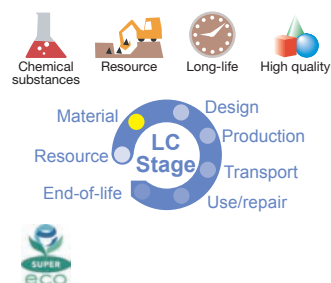
## Product performance

Indemnified against leakage due to its Excellent Leakage Resistance. Superior performance than LR Button Battery.

## Hitachi Maxell, Ltd.

1-1-88, Ushitora, Ibaraki-shi, Osaka, 567-8567, Japan  
Tel +81-072-623-8250 Fax +81-072-623-9014  
E-mail [hiroshi-higashi@maxell.co.jp](mailto:hiroshi-higashi@maxell.co.jp)  
URL <http://www.maxell.co.jp/>

Available in: Worldwide



Silver Oxide Battery SR626SW, SR621SW, SR44 etc.

## EC-2-020

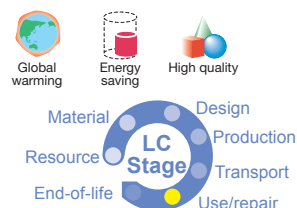
## Electrical and electronic

## medical equipment

## 17-inch direct-conversion FPD (for general radiography systems)

## Environmental performance

The 17-inch direct-conversion FPD is a flatpanel detector that directly converts incident X-rays to electrical signals. To significantly reduce power consumption to 79% that of previous Shimadzu FPDs, Shimadzu has developed a new power supply and integrated-circuit amplifier to read the charge accumulated on each sensor pixel.



## SHIMADZU CORPORATION

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Tel +81-75-823-1113 Fax +81-75-823-2062  
URL <http://www.shimadzu.com/>  
URL <http://www.shimadzu.com/products/medical/index.html>  
URL <http://www.shimadzu.com/about/environmental/index.html>



Available in: Worldwide

17-inch direct-conversion FPD (for general radiography systems)

## EC-2-021

## Electrical and electronic

## X-ray tube assemblies

X-ray output power 4 times greater than that of a conventional tube. Reduced investigation time for X-ray fluorescent spectroscopy

## Environmental performance

- Mitigation of climate change: 20.6 kg reduction in CO<sub>2</sub> emissions compared with a conventional X-ray tube as a result of the reduced use of materials.
- Efficient use of resources: 3.9 kg reduction in the product weight compared with a conventional X-ray tube as a result of the reduced use of materials.
- Management of chemicals: Reduced environmental risks during use and disposal because of the elimination of the use of insulation oil, which is not readily biodegradable.

## Product performance

- Quick investigation: 4 times greater throughput thanks to enhanced X-ray output power.
- Compact: As compact as a conventional unit despite high performance.

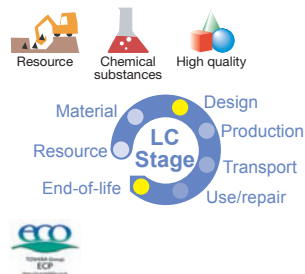
## Toshiba Electron Tubes &amp; Devices Co.,Ltd

1385, Shimoishigami, Otawara-shi, Tochigi, 324-8550, Japan

Fax +81-287-26-6059

URL [http://www.toshiba-tetd.co.jp/tetd/index\\_j.htm](http://www.toshiba-tetd.co.jp/tetd/index_j.htm)

URL <http://www.toshiba-tetd.co.jp/tetd/eng/company/env.htm>



Oil-free X-ray Tube Assembly for Industrial Use AFX-200RA-Pd

## EC-2-022

## Electrical and electronic

## X-ray tube assemblies

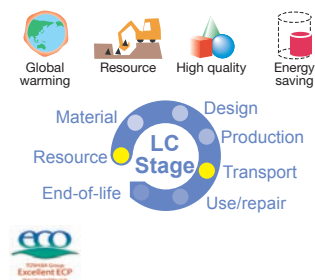
Lightweight, Energy-saving soft X-ray nano-focus X-ray tubes

## Environmental performance

- Downsized sealed off tube using an electro-static focusing gun. (conventional type: electromagnetic focusing, Weight ratio: 1 / 24)
- Elimination of vacuum pumps and insulation oil.

## Product performance

- High brightness, high-precision, ultra-high vacuum
- 0.2  $\mu$ m of focused spot size at 15kV operation
- Observation of organic small samples



## Toshiba Electron Tubes &amp; Devices Co.,Ltd

1385, Shimoishigami, Otawara-shi, Tochigi, 324-8550, Japan

Fax +81-287-26-6059

URL <http://www.toshiba.co.jp/index.htm>

URL <http://www.toshiba-tetd.co.jp/tetd/eng/company/env.htm>



Soft X-ray nano-focus X-ray tubes

EC-2-023

Electrical and electronic

CCD cameras

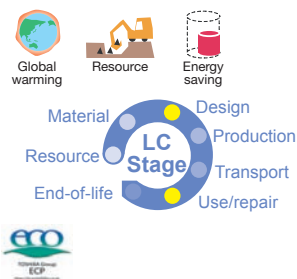
## Lightweight, Compact, Energy-saving CCD Camera System

## Environmental performance

- Mitigation of climate change: Power consumption 9% lower than for the previous model.
- Efficient use of resources: Compact system thanks to about 50% reduction in weight and about 60% reduction in volume compared with the previous model.
- Management of chemicals: Compliant with regulations covering the use of specific hazardous substances.

## Product performance

- High brightness: Advanced technology miniaturizes columnar crystals with optical fiber structure.
- Low noise: The high-contrast, high-brightness image is virtually defect-free. Newly developed processing technology greatly reduces structural noise.



## Toshiba Electron Tubes &amp; Devices Co.,Ltd

1385,Shimoishigami, Otawara-shi, Tochigi, 324-8550, Japan

Fax +81-287-26-6059

URL <http://www.toshiba.co.jp/index.htm>

URL <http://www.toshiba-tetd.co.jp/tetd/eng/company/env.htm>



CCD camera system for X-ray image intensifier VP-34019

EC-2-024

Electrical and electronic

amplifier

## AC Servo Driver

## Environmental performance

The servo driver is used together with the servo motor.

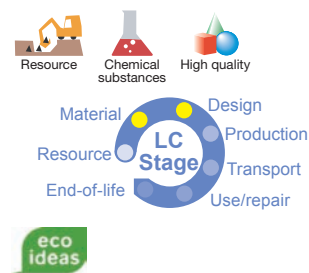
Resource saving : We could design the heat sink and frames lighter than our previous model through the thermal analysis simulation and load inspection.

The weight of this product is 1.68kg. It is 7% lighter than our previous products (1.8kg).

Hazardous chemical substance : These products conform to EU RoHS Directive.

## Product performance

The improvement of the motor performance by the control algorithm and the reduction of energy consumption and thermal loss through the thermal analysis achieved the servo system with small size and high performance.



## Panasonic Corporation Motor Company

7-1-1 Morofuku, Daito City, Osaka, 574-0044, Japan

Tel +81-72-871-1212 Fax +81-72-870-3120

URL <http://panasonic.net/>

URL [http://industrial.panasonic.com/jp/i/25000/motor\\_fa/motor\\_fa.html](http://industrial.panasonic.com/jp/i/25000/motor_fa/motor_fa.html)

URL <http://panasonic.net/csr/>



Available in: Worldwide



## EC-2-025

## Electrical and electronic

motor

## AC Servo Motor

## Environmental performance

The servo motor is used together with the servo driver.

Resource saving : Adoption of high energy gained magnet and reduction of losses by the new MINAS method could lose weight of the motor.

The weight of our new product is 4.11kg. It is 20% lighter than our previous product (5.12kg).

Hazardous chemical substance : These products conform to EU RoHS Directive.

## Product performance

The improvement of the motor performance by the control algorithm and the reduction of energy consumption and thermal loss through the thermal analysis achieved the servo system with small size and high performance.

## Panasonic Corporation Motor Company

7-1-1 Morofuku, Daito City, Osaka, 574-0044, Japan

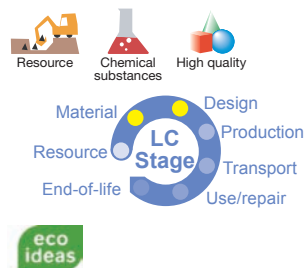
Tel +81-72-871-1212 Fax +81-72-870-3120

URL <http://panasonic.net/>

URL [http://industrial.panasonic.com/ww/i\\_e/25000/motor\\_fa\\_e/motor\\_fa\\_e.html](http://industrial.panasonic.com/ww/i_e/25000/motor_fa_e/motor_fa_e.html)

URL <http://panasonic.net/csr/>

Available in: Worldwide



## EC-2-026

## Electrical and electronic

motor

## DC Brushless Fan Motor for Air-conditioning

## Environmental performance

Energy saving: Efficiency is 85% at the rated power of 40W, and 5 points upper than 80% of conventional motors.

Hazardous chemical substances: compliant with the EU RoHS directive.

## Product performance

This product is a brushless motor for air conditioner units.

High efficiency and low noise have been achieved at the same time by Neodymium magnet rotor and own designed drive IC.

## Panasonic Corporation Motor Company

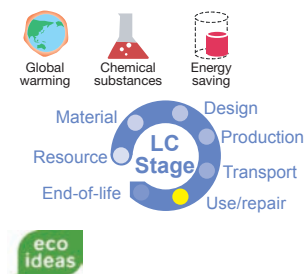
7-1-1 Morofuku, Daito City, Osaka, 574-0044, Japan

URL <http://panasonic.net/>

URL <http://panasonic.net/corporate/segments/motor/>

URL <http://panasonic.net/csr/>

Available in: Japan, China



DC Brushless Fan Motor for Air-conditioning AR-8 series



EC-2-027

Electrical and electronic

motor

## Cooling Fan Motor NMB Turbo Fan®

## Environmental performance

The paired impeller and aileron of the motor bring the same performance as two conventional motors, reducing power consumption by more than 20% compared with conventional products.

- \* The lowest energy consumption motor in the industry (40 mm-size current rating: 1.05A at 12 V [1.2A Max])
- \* High air capacity \*High static pressure (40 mm-size air capacity: 30 CFM, static pressure 3.55 Inch H2O, declared engine speed: 23,000 rpm)
- \* Excellent durability and low vibration and noise (23,000 rpm/60 dB), thanks to Minebea's high-performance interior bearing
- \* The originally-designed impeller and aileron greatly improves the directionality of emissions.

## Product performance

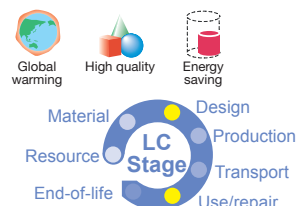
In order to realize the performance of two motors with just a single motor, new optimally-designed fans have been developed to exhaust heat and cool the motor down. The motor has a low-power-consumption structure and uses originally invented magnets. In addition, original high-precision ball bearings, which can spin at more than 23,000 rpm, are equipped to reduce vibrations and noise.

## Minebea Co.,Ltd. / Minebea Motor Manufacturing Corporation

18F Arco Tower, 1-8-1, Shimo-Meguro, Meguro-ku, Tokyo, 153-8662, Japan  
Tel +81-3-5434-8711 Fax +81-3-5434-8700  
URL <http://www.minebea.co.jp/english/index.html>  
URL <http://www.eminebea.com/usa/eMinebea>

Available in: Worldwide

NMB Turbo Fan®



EC-2-028

Electrical and electronic

permanent magnets

## Ferrite Magnet "NMF-12 Series"

## Environmental performance

Hitachi Metals' new ferrite magnet "NMF-12 series" is greatly superior to its previous product. Among ferrite magnets, it provides the industry best magnetic properties as mass production.

These products significantly contribute to the prevention of global warming by being used within motors for electrical components such as starters, anti-lock brake systems, electric power steering, engine cooling fans as well as within home appliances such as air-conditioner compressors, refrigerator compressors, and washing machines.

## Product performance

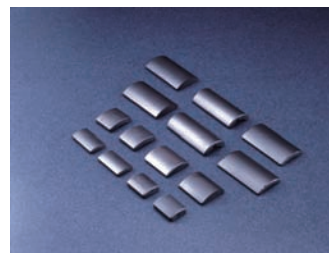
Temperature coefficient of intrinsic coercive force has been lowered to 2/3 of La-Co substitute Sr ferrite magnets, which means little demagnetization even at a low temperature and high resistance against temperature fluctuation.

## Hitachi Metals, Ltd.

SEAVANS North Building, 1-2-1, Shibaura, Minato-ku, Tokyo, 105-8614, Japan  
Tel +81-3-5765-4202  
E-mail [hmcc@hitachi-metals.co.jp](mailto:hmcc@hitachi-metals.co.jp)  
URL <http://www.hitachi-metals.co.jp/e/index.html>  
URL <http://www.hitachi-metals.co.jp/e/prod/prod03/prod03.html>  
URL [http://www.hitachi-metals.co.jp/e/corp/corp14\\_01.html](http://www.hitachi-metals.co.jp/e/corp/corp14_01.html)

Available in: Worldwide

Ferrite Magnet "NMF-12 Series"



## EC-2-029

## Electrical and electronic

## permanent magnets

Neodymium-Iron-Boron Permanent Magnets "NEOMAX<sup>®</sup>"

## Environmental performance

High-energy neodymium-iron-boron (Nd-Fe-B) magnets have the most powerful magnetic properties available today. These products are suitable for use in such high temperature situations as alternators and drive motors of hybrid/electric vehicles (HEVs), which contribute to reduced automobile fuel consumption. "NEOMAX<sup>®</sup>" products are also used in household applications such as refrigerators and air conditioners as well as in wind-powered electricity generation, thereby significantly contributing to the prevention of global warming.



## Hitachi Metals, Ltd.

SEAVANS North Building, 1-2-1, Shibaura, Minato-ku, Tokyo, 105-8614, Japan  
 Tel +81-3-5765-4202  
 E-mail [hmcc@hitachi-metals.co.jp](mailto:hmcc@hitachi-metals.co.jp)  
 URL <http://www.hitachi-metals.co.jp/e/index.html>  
 URL <http://www.hitachi-metals.co.jp/e/prod/prod03/prod03.html>  
 URL [http://www.hitachi-metals.co.jp/e/corp/corp14\\_01.html](http://www.hitachi-metals.co.jp/e/corp/corp14_01.html)

Available in: Worldwide

NEOMAX<sup>®</sup>

## EC-2-030

## Electrical and electronic

## ethernet switch

## Environmentally Resistant Wide-Area Optical Ethernet Switch "MELNET-ES1100"

## Environmental performance

----<< M : Material·Resource saving >>----

- A redesigned heat dissipation mechanism lowers the parts count and reduces weight by 30% compared with conventional models.

----<< E : Energy·Energy saving >>----

A low power consumption LSI has reduced power consumption by 14% compared with conventional models.

----<< T : Toxicity·Chemical substances reduction >>----

No lead used in surface treatment of boards and mounting solder.

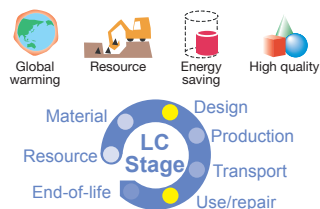
## Product performance

- MELNET-ES1100 is ideal for network configurations requiring environmental resistance and large capacity, such as onsite facility surveillance of roads, rivers, dams, erosion control hotspots, ports and harbors, railways, toll roads and other infrastructure, as well as CCTV video coverage equipment.
- Long-distance transmission up to 80 kilometers.

## Mitsubishi Electric Corporation

2-7-3, Marunouchi Chiyoda-ku, Tokyo, 100-8310, Japan  
 Tel +81-3-3218-9024 Fax +81-3-3218-2465  
 E-mail [eqd.eco@pj.MitsubishiElectric.co.jp](mailto:eqd.eco@pj.MitsubishiElectric.co.jp)  
 URL <http://global.mitsubishielectric.com/index.html>  
 URL <http://global.mitsubishielectric.com/company/csr/environment/products/index.html>  
 URL <http://global.mitsubishielectric.com/company/csr/index.html>

Available in: Japan



Environmentally Resistant Wide-Area Optical Ethernet Switch MELNET-ES1100

EC-2-031

Electrical and electronic

solar charge controllers

## Solar Charge Controller

### Environmental performance

Solar Charge Controller for standalone off grid photovoltaic solar electricity.

Reduces need for fossile energy, nuclear energy, distribution networks.

Reduces in-house pollution.

Electric light replaces kerosene lanterns and candles.

Increases comfort.

### Product performance

Outstanding cost/durability and ease of use for industrial independent power supply and rural electrification

More than 2.000.000.000 people worldwide have no access to electricity. Phocos products allow to build small, distributed, standalone systems to supply electricity based services.

## Phocos

5-28-2 Sendagi, Bunkyo-ku, Tokyo, 113-0022, Japan

Tel +81-3-5814-3352

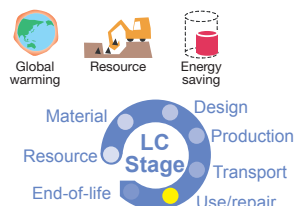
E-mail [info@phocos.com](mailto:info@phocos.com)

URL <http://www.phocos.com>

URL <http://www.phocos.com>

URL <http://www.phocos.com>

Available in: Worldwide



Phocos Rural Solar Electrification

EC-2-032

Electrical and electronic

solar charge controllers

## Solar charging controllers

### Environmental performance

We manufacture a wide range of core system components for energy conversion, energy management, and energy utilization in photovoltaic and other renewable energy sources.

We offer a comprehensive range of solar charge controllers between 4A to 300A with charging currents of 12, 24, and 48V. Flexible programmable hybrid system controllers are available as well.

### Product performance

Phocos is one of the largest suppliers of off-grid power supply system components in the world. Headquartered in Ulm, Germany, Phocos develops, designs, and manufactures products to suit the needs of all stake-holders in the global solar power market.

Phocos is strongly committed to developing and producing products that meet the company's strict specifications in terms of quality, innovation, and technology.

## Phocos SEA Pte Ltd.

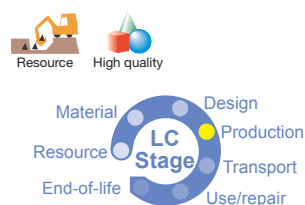
Woodlands Spectrum 1, 2 Woodlands Sector 1, #05-14, 738068, Singapore

Tel +65-6579-0598 Fax +65-6579-0599

E-mail [info-sea@phocos.com](mailto:info-sea@phocos.com)

URL [www.phocos.com](http://www.phocos.com)

Available in: Worldwide



Phocos Charge Controllers

EC-2-033

Electrical and electronic

solar systems

## Solar Panels , BIPV

### Environmental performance

Solar Energy Modules for providing Photovoltaic Energy.  
Solar BIPV Products, Integrated Building Material.



## Hooray Energy Pte Ltd

Woodlands Spectrum 1, 2 Woodlands Sector 1, #05-14, Singapore 738068,  
Singapore  
Tel +65-65155356  
E-mail admin@hoorayenergy.com  
URL www.hoorayenergy.com



Available in: Singapore

EC-2-034

Electrical and electronic

solar systems

## Solar Hybrid System

### Environmental performance

High heat conversion efficiency.

### Product performance

Over 90 % of absorption efficiency  
Light weight  
Available in winter



## A.T.O.M. Institute

2-8-25,Honcho-dori, Morioka-city, Iwate, Japan



Available in: Japan

Solar Hybrid System

## EC-2-035

## Electrical and electronic

## photovoltaic modules

## Multi-crystalline Photovoltaic Module

## Environmental performance

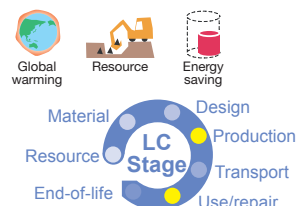
High energy-creation performance by using unlimited solar energy

## Product performance

Newly developed Stress proof inter- connector and unique electrode pattern enable us to relieve the contraction stress originating from thermal expansion by temperature change. The connector and electrode pattern have been developed by applying advanced cell-connection technologies cultivated under longstanding development of Sharp space-use solar cells. These technologies improve reliability of modules, especially ones using thin cells.

## Sharp Corporation

22-22 Nagaike-cho, Abeno-ku, Osaka, 545-8522, Japan  
 Tel +81-6-6625-0438 Fax +81-6-6625-0153  
 E-mail [eco-info@sharp.co.jp](mailto:eco-info@sharp.co.jp)  
 URL <http://sharp-world.com/>  
 URL <http://sharp-world.com/corporate/eco/>



Multi-crystalline Photovoltaic Module ND-153AU

## EC-2-036

## Electrical and electronic

## photovoltaic modules

## Thin-Film Photovoltaic Module

## Environmental performance

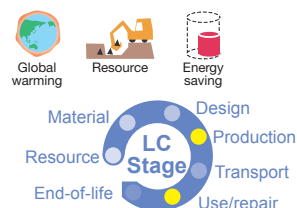
- (1) High energy-creation performance by using unlimited solar energy
- (2) Possible to produce this module with less energy than crystalline photovoltaic module because of low process temperature (under 200 °C) and shorter production process.

## Product performance

- (1) This module includes photovoltaic thin-film silicon with a thickness of 2 micrometer (1/100 comparing with crystalline silicon photovoltaic), which was developed by latest nanotechnology.
- (2) Its superior thermal characteristics enable high performance of power generation in hot weather region.

## Sharp Corporation

22-22 Nagaike-cho, Abeno-ku, Osaka, 545-8522, Japan  
 Tel +81-6-6625-0438 Fax +81-6-6625-0153  
 E-mail [eco-info@sharp.co.jp](mailto:eco-info@sharp.co.jp)  
 URL <http://sharp-world.com/>  
 URL <http://sharp-world.com/corporate/eco/>



Thin Film Photovoltaic Module NA-F135G5

Available in: Japan

## EC-2-037

## Electrical and electronic

## photovoltaic modules

## CIGS thin-film solar module

## Environmental performance

Honda solar module uses a power generation layer of a compound semiconductor made from copper, indium, gallium and selenium (CIGS). The electric power generation layer has only 2 to 3  $\mu\text{m}$  thickness. By manufacturing solar cells using fewer raw materials, effective use of precious earth resources and reduction of both fossil fuel consumption and  $\text{CO}_2$  emissions is made possible.

## Product performance

Honda solar modules deliver stable output power even if the modules are partially shaded without causing a large drop in voltage thanks to the original electrical connecting structure. The color of the compound semiconductor gives the Honda solar modules a stylish black surface that suits various styles of houses and also harmonizes with the town landscape.

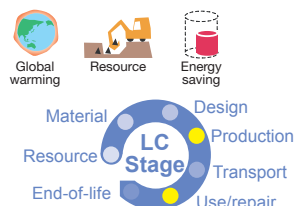
## Honda Motor Co., Ltd.

2-1-1, Minami-Aoyama, Minato-ku, Tokyo, 107-8556, Japan

URL <http://world.honda.com/>

URL <http://world.honda.com/CSR/>

Available in: Japan



CIGS thin-film solar module

## EC-2-038

## Electrical and electronic

## photovoltaic modules

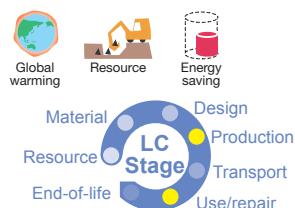
## Amorphous-Silicon thin-film photovoltaic module (F-wave)

## Environmental performance

37.6kg ( $\text{CO}_2$ )/year can be reduced by one PV module. (0.416  $\text{CO}_2\text{-kg/kWh}$  is used for calculation.) Amorphous silicon thin-film PV module can be fabricated by low temperature processes, and uses only 1/200 silicon material comparing with conventional crystalline silicon PV module. Therefore, the environmental load can be reduced drastically.

## Product performance

Easy installation on existing buildings and designed curved surfaces is realized because of light-weight, thin, and flexible features.



88.1kg- $\text{CO}_2$   
not Inspection

Resource/Materials/Production/  
Transfer/Use/End-of-Life

## Fuji Electric Systems Co., Ltd

1.Fuji-machi, Hino-city, Tokyo., 191-8502, Japan

Tel +81-42-585-6410 Fax +81-42-587-0084

E-mail [masuda-masahiko@fesys.co.jp](mailto:masuda-masahiko@fesys.co.jp)

URL <http://www.fesys.co.jp/>

Available in: Japan, Europe



Amorphous-Silicon thin-film photovoltaic module (F-wave)



## EC-2-039

## Electrical and electronic

## photovoltaic modules

## RACK LESS PV FRAME (PV=Photovoltaic)

## Environmental performance

RACK LESS PV FRAME PROVIDES ADVANTAGE OF; (PV=Photovoltaic)

1. Power efficiency is improved by 3% per module area.
2. Weight of mounting system given on building structure is reduced by 95%

## Product performance

RACK LESS PV FRAME PROVIDES ADVANTAGE OF; (PV=Photovoltaic)

1. It makes installation of PV module, with Rack Less PV Frame, simple
2. Design and installation are improved a lot for the PV module with Rack Less PV Frame. A period of time required for such is reduced by approx.60%
3. PV module with Rack Less PV Frame installed together with roof tiles makes roof smart as those are nearly leveled.
4. PV module with Rack Less PV Frame makes it possible to fix mounting brackets right onto rafters owing to sliding mechanism. Pulling strength is expected to be approx. 5 times compared to the conventional mounting system.

## Yanegiken co.,Ltd.

2-3-26 ,Aomi-Cho,Takahama-City, 444-1324, Japan

Available in: Japan, U.S.A



Weight of mounting system given on building structure

## EC-2-040

## Electrical and electronic

## photovoltaic modules

## Solar Module for Residential Use SAMURAI

## Environmental performance

Solar power is a limitless source of energy and a clean way to produce electricity. Utilizing solar energy allows you to contribute to preserving precious natural resources.

## Product performance

Kyocera manufactures all the components at its own production sites, from purchasing material to assembling of modules, to ensure consistently high product quality and reliability. A combination of two thin-profile, compact and light-weight modules, the SAMURAI fit acts like a second roof maximizing power output according to the shape and area of each surface.

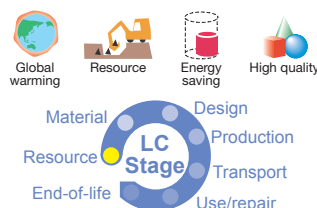
## KYOCERA Corporation

6 Tobadono-cho, Takeda, Fushimi-ku, Kyoto, 612-8501, Japan

Tel +81-75-604-3855

URL <http://www.kyocera.co.jp/>

URL <http://global.kyocera.com/prdct/solar/>



Available in: Japan

SAMURAI

## EC-2-041

## Electrical and electronic

## photovoltaic modules

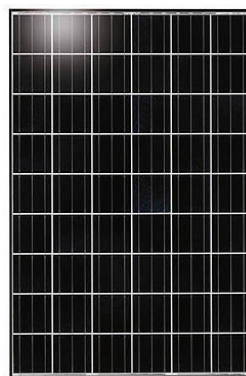
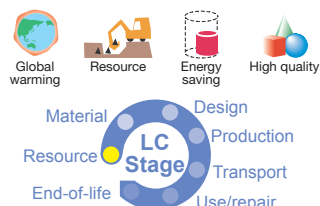
## Solar Module KD210GH-2PU

## Environmental performance

Solar power is a limitless source of energy and a clean way to produce electricity. Utilizing solar energy allows you to contribute to preserving precious natural resources.

## Product performance

Kyocera manufactures all the components at its own production sites, from purchasing material to assembling of modules, to ensure consistently high product quality and reliability. KD210GH-2PU is composed of 54 high-efficiency cells and improved its load limit to 5,400 Pa. (passed TUV certification test IEC 61215 ed.2)



KD210GH-2PU

## KYOCERA Corporation

6 Tobadono-cho, Takeda, Fushimi-ku, Kyoto, 612-8501, Japan  
Tel +81-75-604-3855  
URL <http://www.kyocera.co.jp/>  
URL <http://global.kyocera.com/prdct/solar/>

Available in: Europe

## EC-2-042

## Electrical and electronic

## photovoltaic modules

## Highly-efficient Photovoltaic Module

## Environmental performance

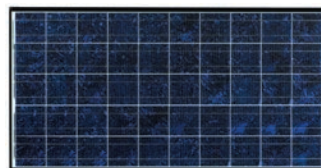
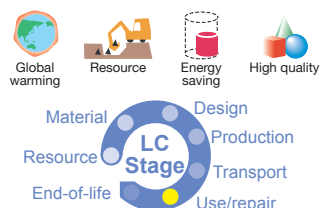
----<< E : Energy · Global warming prevention >>----

This module for houses in Japan realizes 185W output, 38% larger output from conventional model, by enlarging each photovoltaic cell and devising to take more in the reflecting light from back film.

When installing 3.7kW system in Tokyo, about 3842kWh power is to be generated per year, which reduces about 1208kg-CO<sub>2</sub>, corresponding about 61% of CO<sub>2</sub> emission from a general house per year (1980kg-CO<sub>2</sub>).

----<< M : Material · Resource saving >>----

This module does not need a horizontal rack, which is conventionally used for installation. It contributes about 61kg (13%) weight reduction and resource consumption from conventional installation.



PV-MX185H

## Mitsubishi Electric Corporation

2-7-3, Marunouchi Chiyoda-ku, Tokyo, 100-8310, Japan  
Tel +81-3-3218-9024 Fax +81-3-3218-2465  
E-mail [eqd.eco@pj.mitsubishielectric.co.jp](mailto:eqd.eco@pj.mitsubishielectric.co.jp)  
URL <http://global.mitsubishielectric.com/index.html>  
URL <http://global.mitsubishielectric.com/company/csr/environment/products/index.html>

Available in: Japan



EC-2-043

Electrical and electronic  
solar lighting systems

JEMEC Solar Small Home System

Environmental performance

The JEMEC Solar Small Home System is a solution to lack of electricity infrastructure world-wide. It is also a viable option instead of fossil fuel generators in developed nations. Governments can provide electricity to their populations affordably and without the need for massive infrastructure projects.

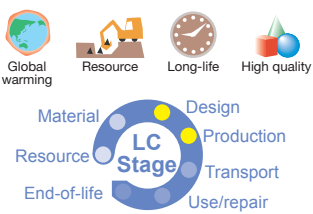
Product performance

The system is a tailor-made solution for electrification projects. The main model can provide up to 1kw of power per day. The system includes all components necessary to create electricity. User just needs to plug in the provided appliance and solar panel into the labeled sockets. The system is comprised of a 100W solar panel, 100Ah battery, 10A charge controller, DC/AC inverter, system box, cables, 11W bulbs (2) and a DC fan.

JEMEC Japan Limited

Ueda Bldg. Rm. 701, Yamashita-cho 25-1, Naka-ku, Yokohama, 231-0023, Japan  
Tel +81-45-662-7047 Fax +81-45-662-4050  
E-mail [sami@jemec.jp](mailto:sami@jemec.jp)  
URL [www.jemec.jp](http://www.jemec.jp)  
URL [jemec-japan.com](http://jemec-japan.com)

Available in: Worldwide



JEMEC Solar Small Home System (100W model)

## EC-3-001

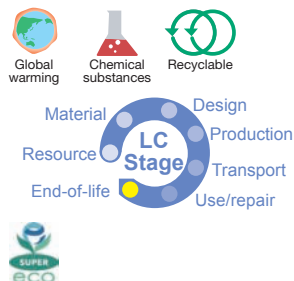
## Semiconductor-related

## wiring devices

## Modified II Tin Plating FFC (Flexible Flat Cable)

## Environmental performance

- Lead-free and complies with RoHS directive.
- Mitigate Whisker (Crystallization of thin needles) from tin plated conductor surface without gold plating, which prevents resource depletion.



## Hitachi Cable, Ltd.

Hitaka Works, 5-1-1 Hitaka-cho, Hitachi-shi, Ibaraki, 319-1414, Japan  
 Tel +81-294-25-3835 Fax +81-294-43-3852  
 E-mail [taketani.noriaki@hitachi-cable.co.jp](mailto:taketani.noriaki@hitachi-cable.co.jp)  
 URL <http://www.hitachi-cable.co.jp/en/index.html>  
 URL <http://www.hitachi-cable.co.jp/ICSFiles/cable/ewc/07/cuj/all.pdf>  
 URL <http://www.hitachi-cable.co.jp/en/about/publish/csr/index.html>



Modified II tin plating FFC (Flexible Flat Cable)

## EC-3-002

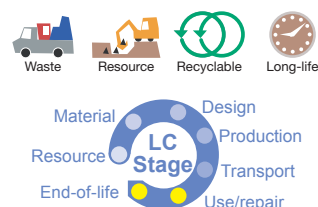
## Semiconductor-related

## parts of semiconductor manufacturing equipment

## PureBeta

## Environmental performance

Along with strong research and development program, Bridgestone has produced a high-purity silicon carbide powder created through the combination of high-level polymer technology. It is manufactured on a very clean production line by sintering, processing and cleaning. Because of its excellent resistance against wet cleaning, those SiC sintering products can be used almost permanently which is also good for the environment. Further, SiC single crystal wafer is one of the promising candidates for electronic devices used for hybrid vehicle, low loss invertors and LEDs which has high expectation on global energy saving and CO<sub>2</sub> emission reduction. This product has yielded an integrated production flow from the raw materials to the fabrication



## Bridgestone Corporation

3-1-1, Ogawahigashi-Cho, Kodaira-Shi, Tokyo, 187-8531, Japan  
 Tel +81-42-342-6486 Fax +81-42-342-6428  
 E-mail [pbinfo@group.bridgestone.co.jp](mailto:pbinfo@group.bridgestone.co.jp)  
 URL <http://www.bridgestone.co.jp/english/index.html>  
 URL <http://www.purebeta.com/global/>



Pure Beta

## EC-3-003

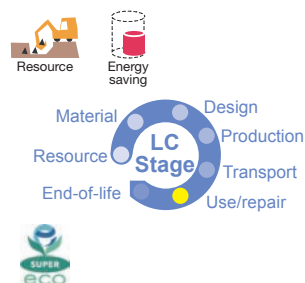
## Semiconductor-related

single chip inverter

## Single Chip Inverter IC

## Environmental performance

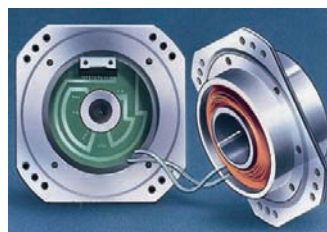
The Single-chip inverter IC integrates various devices and circuits that are necessary for inverter control onto a single die. The inverter IC controls a motor at various speeds. The variable speed control improves the efficiency of motors. The inverter IC downsizes the control board of motors utilizing single chip structure, which allows the control board mounting the inverter IC to be embedded into a motor. The inverter IC, which is a lead-free (Pb-free) product conforming to JEITA Phase 3A, is environmentally friendly.



## Hitachi, Ltd.

Akihabara Daibiru Building, 18-13 Soto-Kanda 1-chome, Chiyoda-ku, Tokyo, 101-8608, Japan

Available in: Japan



## EC-3-004

## Semiconductor-related

circuit substrate for motor-drives

## High-reliability Al circuits substrate (DBA substrate) for motor-drive of eco-cars

## Environmental performance

Al circuits substrate (DBA substrate) with high reliability for power modules have been mounted on the hybrid vehicles of above one million since the beginning of our mass-production. At present, AlN insulator is the main stream, but we promote also the practical use of various ceramics including silicon nitride and others for DBA substrates.

## Product performance

As the parts for the automobile field, it is required that peeling-off and cracking at the junction portion do not occur by the thermal cycling test (-40 ~ 125°C, more than 3,000 cycles).

Compared to the conventional substrates, our company's product satisfied such severe requirements, and has been used as an important part in the mobile application which needs high reliability. For example, it is used as a part of the inverter for motor drive of the eco-cars such as hybrid vehicles and electric automobiles.

## Mitsubishi Materials Corporation (Sanda Plant Shizuoka DBA Center)

1400 Suganuma, Oyamacho, Suntogun, Shizuoka, 410-1312, Japan

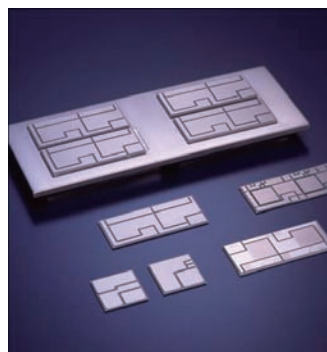
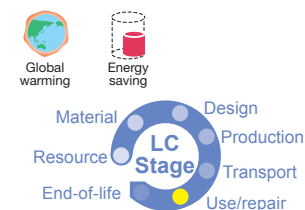
Tel +81-550-76-3106 Fax +81-550-76-3107

E-mail [suzukiss@mmc.co.jp](mailto:suzukiss@mmc.co.jp)

URL <http://www.mmc.co.jp/corporate/en/index.html>

URL <http://www.mmc.co.jp/corporate/en/product/auto/0602.html>

URL <http://www.mmc.co.jp/corporate/en/csr/csr.html>



Available in: Japan, Europe, U.S.A

DBA (Direct Brazed Aluminum) Substrates

## EC-3-005

## Semiconductor-related

## power modules

## Intelligent Power Module

## Environmental performance

----<< M : Material · Resource saving >>----

Use of a high heat dissipation insulation structure achieved a reduced junction temperature rise in power chips. This allowed for a smaller package and led to a significant reduction (about 40%) of the mounting area on the PCB compared to our previous products.

----<< E : Energy · Energy saving >>----

By integrating a full-gate CSTBT<sup>TM</sup>\*, which is one of Mitsubishi Electric's advanced IGBTs, electric power consumption in the system was reduced.

\* CSTBT<sup>TM</sup> (Carrier Stored Trench Gate Bipolar Transistor) : Mitsubishi's original IGBT utilizing the novel carrier storage effect.

----<< T : Toxicity · Chemical substances reduction >>----

Introduction of lead-free process for soldering power chips and plating outer terminals realized all lead-free products (RoHS compliant) .

\*Awarded the 52nd Okochi Prize (Production award)

## Mitsubishi Electric Corporation

2-7-3, Marunouchi, Chiyoda-ku, Tokyo, 100-8310, Japan

Tel +81-3-3218-9024 Fax +81-3-3218-2465

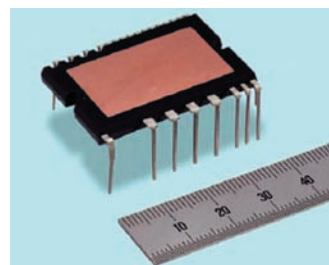
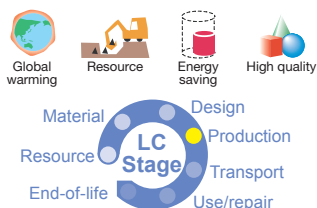
E-mail eqd.eco@pj.MitsubishiElectric.co.jp

URL <http://global.mitsubishielectric.com/index.html>

URL <http://global.mitsubishielectric.com/company/csr/environment/products/index.html>

URL <http://global.mitsubishielectric.com/company/csr/index.html>

Available in: Worldwide



DIPIM<sup>TM</sup> (Dual-in-line Package Intelligent Power Module)

## EC-3-006

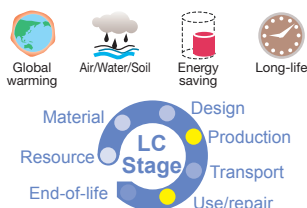
## Semiconductor-related

## films for solar cells

## EVA film for a solar cell

## Environmental performance

A solar cell is a kind of clean system which does not emit CO<sub>2</sub> and other hazardous substances during use. It has become more and more important recent years by the viewpoint of earth environment protection. Bridgestone is manufacturing and selling EVA film of EVASKY brand which is used as a seal material for Silicon cell. EVASKY has been highly evaluated by customers due to its high efficiency, high productivity and high durability.

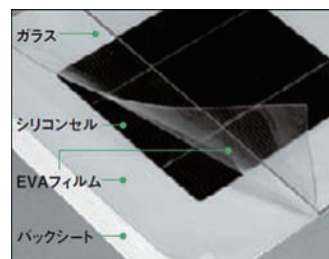


## Bridgestone Corporation

1-6-6, Yaesu, Chuo-ku, Tokyo, 103-0028, Japan

Tel +81-3-5202-6907 Fax +81-3-5202-6842

URL <http://www.bridgestone.co.jp/english/index.html>



EVA film for solar cells

## EC-4-001

## Machine parts

## railway wheels

## High-speed railway wheels and axles

## Environmental performance

As a modal shift, high-speed railway lines are being planned all over the world. High-speed railway wheels and axles contribute to reducing CO<sub>2</sub> emissions that takes place in the transport sector.

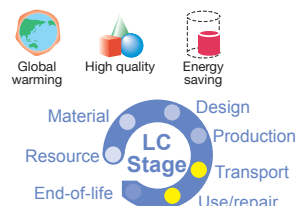
## Product performance

Sumitomo Metals controls a 100% share of the market for the wheels and axles that are used in the famous Japanese "bullet trains," as well as a high market share of the brake discs and driving systems. We also control a 30% share of the world market for high-speed railway wheels, and have earned a high level of trust. We have recently concluded a long-term, three-year contract for high-speed railway replacement wheels with the German railway company Deutsche Bundesbahn, and are meeting the growing demand from high-speed railways.

## Sumitomo Metal Industries, Ltd.

1-8-11 Harumi, Chuo-ku, Tokyo, 104-6111, Japan  
Tel +81-3-4416-6183 Fax +81-3-4416-6793  
E-mail [chikyu-kan@sumitomometals.co.jp](mailto:chikyu-kan@sumitomometals.co.jp)  
URL <http://www.sumitomometals.co.jp>

Available in: Worldwide



Wheels and axles

## EC-4-002

## Machine parts

## heat transfer tubes

## High Performance Heat Transfer Tube

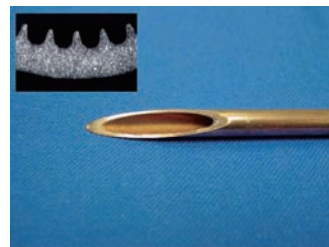
## Environmental performance

Features of high performance heat transfer tube for CO<sub>2</sub> heat pump system.

- Spiral grooves keep the flow of the refrigerant unsteady, which increases the heat transfer rate in a way more efficient than increasing the inner surface area.
- More increase in the heat transfer rate than that of pressure loss is acquired in comparison with smooth tube.
- Achieved the industry top heat transfer rate for CO<sub>2</sub> heat pump system (as of July 2008).

## Hitachi Cable, Ltd.

Hitaka Works, 5-1-1 Hitaka-cho, Hitachi-shi, Ibaraki, 319-1414, Japan  
Tel +81-294-25-3835 Fax +81-294-43-3852  
E-mail [taketani.noriaki@hitachi-cable.co.jp](mailto:taketani.noriaki@hitachi-cable.co.jp)  
URL <http://www.hitachi-cable.co.jp/en/index.html>  
URL <http://www.hitachi-cable.co.jp/en/products/copper/index.html>  
URL <http://www.hitachi-cable.co.jp/en/about/publish/csr/index.html>



Inner-grooved tube

EC-4-003

Machine parts

tool

## Super Radius Mill ASR Multi-flutes type

## Environmental performance

Recently growing environmental awareness has resulted to change the type of cutting method along with other drastic modification. In effort to improve the method and life of cutting tools, Hitachi Tool Engineering developed "ASR Multi-flutes type with JX coating". This tool with new small inserts geometry shows extremely high cutting performance under high feed operation. New indexable tool were made multi-flute with small inserts. In addition, JX coating make long tool life because of coating characteristics has greatly improved in their lubricant, hardness, heat-resistance and chipping resistance.

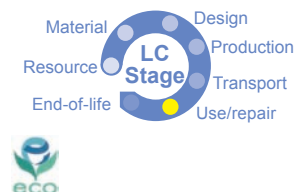
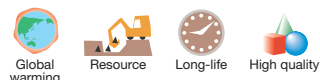
## Product performance

Small inserts, breakage resistance has been greatly improved, so that use at the maximum feed rate of the latest machining equipment ( $V_f \geq 20\text{m/min.}$ ) is recommended.

## Hitachi Tool Engineering, Ltd.

SEAVANS North Building, 1-2-1, Shibaura, Minato-ku, Tokyo, 105-0023, Japan  
Tel +81-3-6858-2204 Fax +81-3-6858-2229  
URL <http://www.hitachi-tool.co.jp/e/index.html>  
URL <http://www.hitachi-tool.co.jp/e/products/index.html>  
URL <http://www.hitachi-tool.co.jp/e/environment/index.html>

Available in: Worldwide



Products with ASR Multi-flutes type and JX coated inserts

EC-4-004

Machine parts

tool

## Epoch Mirus series

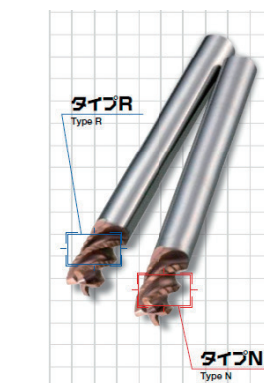
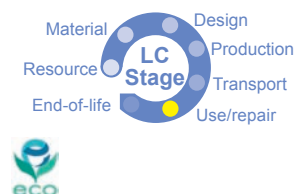
## Environmental performance

Recently, development of ECO production tend to improve tool life, efficiency and cutting method. This is a revolutionary tool developed for improving efficiency, and made unprecedented high efficiency possible. There are two features of figures. One is Unequal phase to reduce cutting vibration. The other one is Double gash guarantees to remove thick chip smoothly. In addition, this tool is adopted TH coating which further improved hardness and oxidation resistance. It will achieve stable cutting in a high cutting temprature, can dry cutting without coolant, shorten operating time of M/C, and reduce an electricity expense.

## Hitachi Tool Engineering, Ltd.

SEAVANS North Building, 1-2-1, Shibaura, Minato-ku, Tokyo, 105-0023, Japan  
Tel +81-3-6858-2204 Fax +81-3-6858-2229  
URL <http://www.hitachi-tool.co.jp/e/index.html>  
URL <http://www.hitachi-tool.co.jp/e/products/index.html>  
URL <http://www.hitachi-tool.co.jp/e/environment/index.html>

Available in: Worldwide



EMXR4080-TH



## EC-4-005

## Machine parts

bearing

## High Corrosion Resistant Miniature Bearings "Giga Protection Series"

## Environmental performance

The Giga Protection bearings can be expected to be used in the applications requiring high resistance to rust and corrosion-using these bearings in easily rusting parts, enable users to largely reduce maintenance after the purchase of the product.

## Product performance

Size:

Ranges from 15mm or less in outside diameter

Main applications:

Products requiring high corrosion resistance,such as fishing gears (fishing reels) and marine equipment;wind gauges;and medical equipment

\*Lower in load bearing performance than conventional stainless steel bearings due to the characteristics of the materials.Ideally suited to comparatively low load bearing applications.

Features:

Adoption of special materials improves the corrosion resistance by 20times or more (500 hours or more at neutral salt spray tests) compared with stainless steel bearings.Surface modification treatment is not required.

Sample price:JPY 1,000 per piece

## Minebea Co.,Ltd.

18F Arco Tower,1-8-1,Shimo-Meguro,Meguro-ku,Tokyo, 153-8662, Japan

Tel +81-3-5434-8711 Fax +81-3-5434-8700

URL <http://www.minebea.co.jp/english/index.html>

URL <http://www.eminebea.com/usa/eMinebea>



High Corrosion Resistant Miniature Bearings "Giga Protection Series"

Available in: Worldwide

## EC-4-006

## Machine parts

bearing

## World's Smallest Ball Bearings with Ultra-small Outer Diameter of 1.5 mm

## Environmental performance

Ultra-small ball bearings that are 1.5 mm in outer diameter and 0.65 mm in thickness, making them the smallest in the world.These ball bearings have the same pressed-steel ball bearing cage structure as normal miniature ball bearings and will be mass-produced.

It is such an ultra-small miniature bearing thus leads to saving sapce and material consumption.

## Product performance

Size:

Outer diameter of 1.50mm,

Inner diameter of 0.50mm,

Thickness (width) of 0.65mm (low-speed type can be slimmed down to 0.4mm),Ball diameter of 0.25mmx6 balls

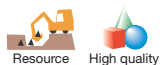
Material:Stainless steel

Features:World's smallest ball bearings with same pressed-steel ball bearing cage structure as regular miniature ball bearings.

Performance:Capable of high-speed rotation of more than 5,000rpm

Uses:Envisioned for use in the moving parts of medical devices,micro-machines and other ultra-small precision devices.

Price:Sample shipment price of 5,000 yen/unit



World's Smallest Ball Bearing

Available in: Worldwide



EC-4-007

Machine parts

pumps

## Environmentally friendly turbo-molecular pump TMP-2804/3304LMC series

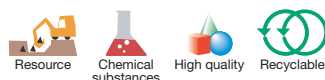
## Environmental performance

TMP-2804/3304LMC Series turbo-molecular pumps offer 25% higher pumping speed than the current model, but have a smaller flange.

The EI-R04M controller is common to all pumps. It switches automatically to match the pump model.

All parts of pump and controller are RoHS-compliant.

TMP-2804/3304LMC Series and EI-R04M are environmentally friendly with enhanced recycling rate.



## SHIMADZU CORPORATION

1, Nishinokyo-Kuwabaracho, Nakagyo-ku, Kyoto, 604-8511, Japan

Tel +81-75-823-1113 Fax +81-75-823-2062

URL <http://www.shimadzu.com/index.html>

URL <http://www.shimadzu.com/products/industrial/vacuum/index.html>

URL <http://www.shimadzu.com/about/environmental/index.html>



Available in: Worldwide

TMP-3304LMC series EI-R04M

EC-4-008

Machine parts

pumps

## Energy-saving canned motor pumps

## Environmental performance

8-steps controlled energy-saving drive can be done with the internal inverter carried on the pump. Further, it has an automatic variable speed control function by external signal input and trouble caution signal output function as standard.

## Product performance

Application of the canned motor and inverter enable the pump to be compact. Because of the leakage-free design, the sealing device is maintenance free.



## EBARA CORPORATION

11-1 Haneda Asahi-cho, Ohta-ku, Tokyo, 144-8510, Japan

Tel +81-3-3743-6111 Fax +81-3-5736-3100

E-mail [webmaster@ebara.com](mailto:webmaster@ebara.com)

URL [www.ebara.co.jp](http://www.ebara.co.jp)



Hz-free pump model MMF

EC-4-009

Machine parts

industrial machinery and equipment

## Micro Cutting Technology

## Environmental performance

In this day and age, you cannot make any products without taking into account environmental issues. For machinery, the supply of ultra-fine, ultra-precision parts is in demand, much more than ever. Matsuura Works' micromachining technology can be incorporated for the product development.

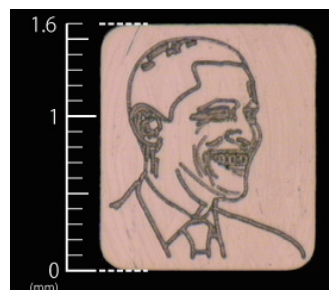
## Product performance

Matsuura Works handles stainless steel, aluminum, brass, titanium and other metals, as well as glass and ceramics, realizing precision levels down to 1 μm for machining and lathe turning, and 30 μm diameters for hole drilling and milling. They also do medical equipment, various nozzles, orifices, and other products. Being experts in high quality machining, they can also provide product quality assurance inspection services.

## Matsuura Works Ltd. (Ecotwaza Co.,Ltd)

1-6-12 Naka Kunitachi-shi, Tokyo, 186-0004, Japan  
Tel +81-42-573-5613 Fax +81-42-573-5613  
E-mail [info@ecotwaza.com](mailto:info@ecotwaza.com)  
URL [www.cho-seimitsu.com](http://www.cho-seimitsu.com)

Available in: Worldwide



30 μm groove processing machining

EC-4-010

Machine parts

motors

## Series Spindle Motors Striving for Energy saving and Resource conservation

## Environmental performance

----< M : Material·Resource saving >----

The SJ-D Series' revised electrical design cuts the use of copper wiring by 43%, while its optimized structure lowers the parts count.

----< E : Energy·Energy saving >----

The optimal electrical design facilitates a 25% reduction in motor power loss compared with conventional models, lowering power consumption.

----< T : Toxicity·Chemical substances reduction >----

Compliant with European RoHS Directive.

## Product performance

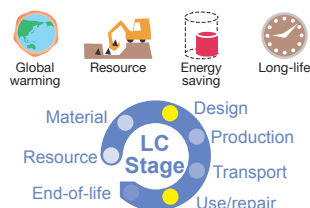
Mitsubishi Electric continues to strive for energy savings and resource conservation in its products as part of its environmental countermeasures.

In a field where industrial equipment products have a lifespan in excess of 10 years, this series fuses functionality and design to become a product unaffected by prevalent trends. The SJ-D Series of spindle motor was awarded a Good Design Award (Best 15) in 2009.

## Mitsubishi Electric Corporation

2-7-3, Marunouchi Chiyoda-ku, Tokyo, 100-8310, Japan  
Tel +81-3-3218-9024 Fax +81-3-3218-2465  
E-mail [eqd.eco@pj.MitsubishiElectric.co.jp](mailto:eqd.eco@pj.MitsubishiElectric.co.jp)  
URL <http://global.mitsubishielectric.com/index.html>  
URL <http://global.mitsubishielectric.com/company/csr/environment/products/index.html>  
URL <http://global.mitsubishielectric.com/company/csr/index.html>

Available in: Japan, Worldwide



Spindle Motor SJ-D Series

## EC-4-011

## Machine parts

## parabolic mirrors

## High-Precision, High-Quality OFF-AXIS PARABOLIC MIRRORS SPA Series

## Environmental performance

Off-axis parabolic mirrors turn plane waves into spherical waves, and vice versa, at high precision. These aspherical mirrors are essential for spectrometers and interferometers that require high resolution.

RoHS Compliant product

## Product performance

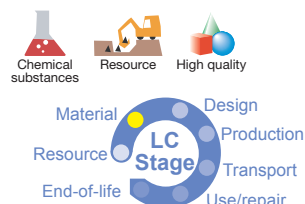
The Off-axis Parabolic Mirrors SPA Series has the following features:

- (1) Surface accuracy of  $\lambda/6$  has been achieved through the newly-developed precision replica technology (conventional Shimadzu product:  $\lambda/2$ ,  $\lambda = 632.8\text{nm}$ ).
- (2) Stable quality due to the production of a replica mirror using a high-precision master mirror.
- (3) Proven mass-production technology ensures a stable supply of large quantities.

## SHIMADZU CORPORATION

1, Nishinokyo-Kuwabaracho, Nakagyo-ku, Kyoto, 604-8511, Japan  
 Tel +81-75-823-1113 Fax +81-75-823-2062  
 URL <http://www.shimadzu.com/index.html>  
 URL <http://www.shimadzu.com/products/opt/off/5iqj1d0000001k2i.html>  
 URL <http://www.shimadzu.com/about/environmental/index.html>

Available in: Worldwide



Off-Axis Parabolic Mirror SPA Series

## EC-4-012

## Machine parts

## fan motors

## Weather-Resistant, Long-Life, High-Performance AC Fan Motors

## Environmental performance

A series of weather-resistant (oil proof and dust proof), long-life AC fan motors for products used in harsh environments, such as machine tools and inverters, and for products used outdoors, such as solar light generation systems and re-chargers for electric vehicles.

## Product performance

<Size>

120 square (11mm x 38mm), 170 circle (15mm x 172mm x 38mm)

<Features>

"Metal Blades Type" and "Plastic Blades Type (PBT)"

IP54 - equivalent coil section

- Coil section formed in one piece of epoxy resin

- Dramatically improved oil proof and dust proof capabilities

<Expected life>

Improvement to 100,000 hours at 25 degrees in centigrade

. (Plastic Blades Type)

(Conventional models: 50,000 hours at 25 degrees in centigrade.)

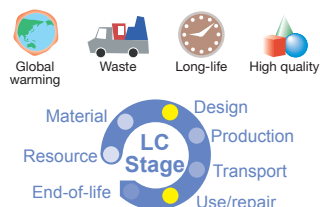
<Safety standards>

JET, UL, VDE and CE are obtained.

## Minebea Co.,Ltd. / Minebea Motor Manufacturing Corporation

18F Arco Tower, 1-8-1, Shimo-Meguro, Meguro-ku, Tokyo, 153-8662, Japan  
 Tel +81-3-5434-8711 Fax +81-3-5434-8700  
 URL <http://www.minebea.co.jp/english/index.html>  
 URL <http://www.eminebea.com/usa/eMinebea>

Available in: Japan, Asia, Europe, U.S.A



High Weather-Resistant, Long-Life, High-Performance AC Fan Motor Series

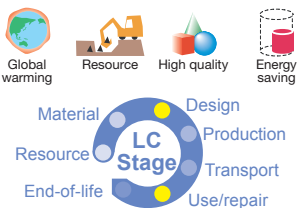
EC-4-013

Machine parts  
fan motors

Low power consumption fan "San Ace92" GA type

Environmental performance

Developed highly efficient blade and frame, which achieves low power consumption while maintaining the cooling performance, assuming the actual installation condition. Power consumption is reduced by approx. 30 % compared with our conventional fan (92×92×38mm fan "San Ace 92" GV type [Model No: 9GV0912P1H03]).



SANYODENKI CO.,LTD.

1-15-1, Kita-otsuka Toshima-ku Tokyo, Japan  
Tel +81-3-3917-5151  
URL <http://www.sanyodenki.co.jp/en/index.html>



Available in: Worldwide

## EC-5-001

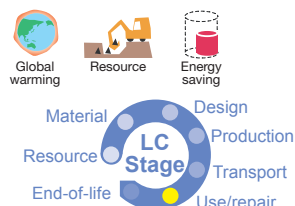
## Automobile parts

## tires for trucks and buses

## Fuel economy Truck and Bus Tires "ECOPIA M891II"

## Environmental performance

It is necessary to develop a new generation tire for fuel savings and to preserve the earth's environment. Especially, it is useful for trucks and buses, as fuel-guzzling vehicles, to reduce the rolling resistance of tires. Bridgestone corporation has developed low rolling resistance truck and bus tires, and has already launched them into the market as the "ECOPIA" line. ECOPIA has superior low rolling resistance for long haul users, while maintaining basic tire performance. Newly introduced ECOPIA M891 II is the successor to ECOPIA M881.



ECOPIA M891 II

## Bridgestone Corporation

10-1, Kyobashi 1-chome, Chuo-ku, Tokyo, 104-8340, Japan  
 Tel +81-3-3563-6972 Fax +81-3-3563-1165  
 URL <http://www.bridgestone.co.jp/english/index.html>

## EC-5-002

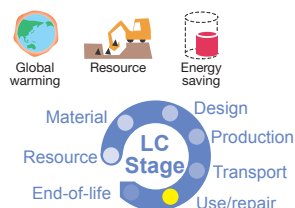
## Automobile parts

## tires for trucks and buses

## Fuel economy Truck and Bus Tires "ECOPIA W911"

## Environmental performance

It is necessary to develop a new generation tire for fuel savings and to preserve the earth's environment. Especially, it is useful for trucks and buses, as fuel-guzzling vehicles, to reduce the rolling resistance of tires. Bridgestone corporation has developed low rolling resistance truck and bus tires, and has already launched them into the market as the "ECOPIA" line. ECOPIA has superior low rolling resistance for long haul users, while maintaining basic tire performance. ECOPIA W911 has been introduced as an all-round studless tire for snow/ice performance and improved fuel economy. (Rolling Resistance 23% lower than W910)



ECOPIA W911

## Bridgestone Corporation

10-1, Kyobashi 1-chome, Chuo-ku, Tokyo, 104-8340, Japan  
 Tel +81-3-3563-6972 Fax +81-3-3563-1165  
 URL <http://www.bridgestone.co.jp/english/index.html>

EC-5-003

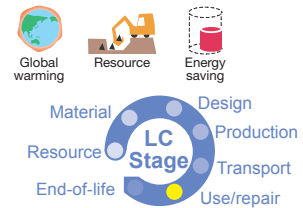
Automobile parts

tires for trucks and buses

### Fuel economy Truck and Bus Tires "ECOPIA R221II"

#### Environmental performance

It is necessary to develop a new generation tire for fuel savings and to preserve the earth's environment. Especially, it is useful for trucks and buses, as fuel-guzzling vehicles, to reduce the rolling resistance of tires. Bridgestone corporation has developed low rolling resistance truck and bus tires, and has already launched them into the market as the "ECOPIA" line. ECOPIA has superior low rolling resistance for long haul users, while maintaining basic tire performance. Newly introduced ECOPIA R221II is the successor to R221, maintaining basic tire performance and improved fuel economy.



#### Bridgestone Corporation

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URL <http://www.bridgestone.co.jp/english/index.html>



ECOPIA R221 II

EC-5-004

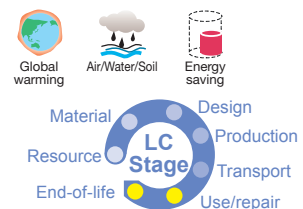
Automobile parts

tires for trucks and buses

### Tire for Super Single Drive Axle "GREATEC"

#### Environmental performance

Bridgestone launched the GREATEC line in 2000 as ultralow aspect ratio tires to replace dual drive tires on trucks and buses with single tires. GREATEC tires improve fuel economy because a GREATEC tire and rim weighs less than two conventional tires and rims. In addition, this concept contributes to waste saving.



#### Bridgestone Corporation

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Tel +81-3-3563-6972 Fax +81-3-3563-1165  
URL <http://www.bridgestone.co.jp/english/index.html>



GREATEC

## EC-5-005

## Automobile parts

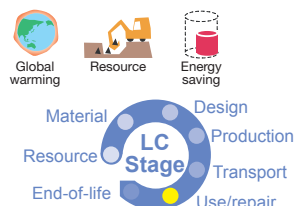
## tires for trucks and buses

## DURAVIS R670

## Environmental performance

DURAVIS is "working radial" tire for bus and truck, which gives you high economic performance.

The outstanding technology of DURAVIS R670, which improves abrasion resistance and prolongs tire life 20% longer than conventional product. It contributes to save waste and cost down by long life.



DURAVIS R670

## Bridgestone Corporation

10-1, Kyobashi 1-chome, Chuo-ku, Tokyo, 104-8340, Japan

Tel +81-3-3563-6972 Fax +81-3-3563-1165

URL <http://www.bridgestone.co.jp/english/index.html>

## EC-5-006

## Automobile parts

## tires for passenger cars

## Eco-friendly tire "REGNO"

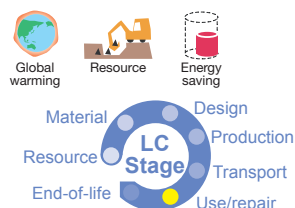
## Environmental performance

REGNO provides you first class ride comfort & super-excellent silence in your car.

REGNO focuses on high frequency tire noise reduction by applying Bridgestone's latest silence technology.

Also REGNO reduces rolling resistance about 16%\* compared with the previous model, so it contributes to save energy and reduce CO<sub>2</sub> emissions when running.

\* REGNO GR-9000



(1)

(2)

## Bridgestone Corporation

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Tel +81-3-3563-6972 Fax +81-3-3563-1165

URL <http://www.bridgestone.co.jp/english/index.html>

(1) REGNO GRV (2) REGNO GR-9000



EC-5-007

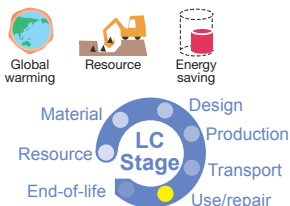
Automobile parts

tires for passenger cars

### Eco-friendly tire "Playz"

#### Environmental performance

Playz provides you a smooth ride by controlling car trembling. In environmental side, Playz reduces rolling resistance about 3% compared with the previous model, so it contributes to save energy and reduce CO<sub>2</sub> emissions when running.



#### Bridgestone Corporation

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URL <http://www.bridgestone.co.jp/english/index.html>



Playz PZ-X

EC-5-008

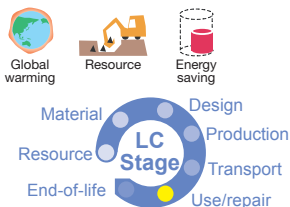
Automobile parts

tires for passenger cars

### Eco-friendly tire "B'STYLE EX"

#### Environmental performance

B'STYLE EX is a well balanced tire that combines safety with ECO friendly performance. B'STYLE EX possesses outstanding braking performance in wet conditions, and reduces rolling resistance about 10%. So B'STYLE EX gives you safe driving and contributes to save energy and reduce CO<sub>2</sub> emissions when running.



#### Bridgestone Corporation

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URL <http://www.bridgestone.co.jp/english/index.html>



B'STYLE EX

## EC-5-009

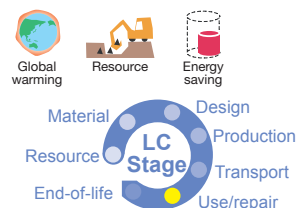
## Automobile parts

tires for passenger cars

## Eco-friendly tire "SNEAKER"

## Environmental performance

SNEAKER gives you basic and economic performance as a standard tire. On the environmental side, SNEAKER reduces rolling resistance about 10% compared with the previous model, so it contributes to save energy and reduce CO<sub>2</sub> emissions when running.



SNEAKER SNK2

## Bridgestone Corporation

10-1, Kyobashi 1-chome, Chuo-ku, Tokyo, 104-8340, Japan  
 Tel +81-3-3563-6972 Fax +81-3-3563-1165  
 URL <http://www.bridgestone.co.jp/english/index.html>

## EC-5-010

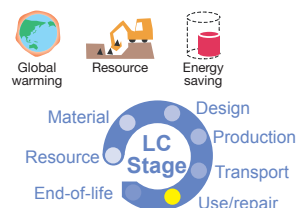
## Automobile parts

tires for passenger cars

## Eco-friendly tire "ECOPIA EP100"

## Environmental performance

The ECOPIA EP100 employs a new top rubber which applies Bridgestone's unique materials technology NanoPro-Tech to reduce rolling resistance. Comparing the ECOPIA EP100 with the general commodity tire, rolling resistance is cut down 30%, so it contributes to save energy and reduce CO<sub>2</sub> emissions when running. Also ECOPIA EP100 has outstanding braking performance in wet conditions in order to maintain safety.



ECOPIA EP100

## Bridgestone Corporation

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 Tel +81-3-3563-6972 Fax +81-3-3563-1165  
 URL <http://www.bridgestone.co.jp/english/index.html>

EC-5-011

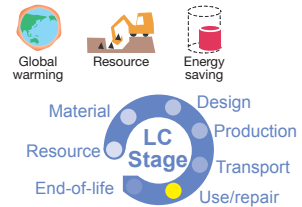
Automobile parts

tires for passenger cars

## BLIZZAK REVO GZ

### Environmental performance

In 1988, BLIZZAK was released in Japan. BLIZZAK, which are studless winter tires, took the place of conventional studded tires. The outstanding technology of BLIZZAK REVO GZ, which promises safety on winter roads throughout the world, also offers high perf.



### Bridgestone Corporation

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URL <http://www.bridgestone.co.jp/english/index.html>



BLIZZAK REVO GZ

EC-5-012

Automobile parts

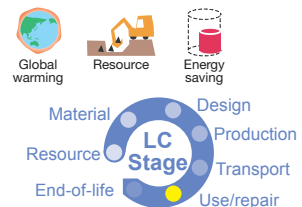
tires for passenger cars

## Run-Flat tire "POTENZA RE050 RFT"

### Environmental performance

The self supporting Run-Flat tire has reinforced sidewalls to support the load of vehicle even after a loss of tire pressure. Run-Flat tire enables to eliminate the use of spare tire. Eliminating spare tires from all vehicles would help save resources by reducing the approximately 59 million (1) spare tires annually. Furthermore, CO<sub>2</sub> emissions over the spare tire lifecycle-from raw material procurement to disposal-could be lowered by approximately 2 millions tons of CO<sub>2</sub> per year. (2) Additional CO<sub>2</sub> emissions can be reduced by the elimination of wheels for the spare tires.

- (1) Bridgestone investigation
- (2) Tire CO<sub>2</sub> emissions are calculated in accordance with the Japan Rubber Manufacturers Association's "Tire Inventory Analysis Trail" (1998 version). During the usage stage, emissions are considered to be zero.



### Bridgestone Corporation

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Tel +81-3-3563-6972 Fax +81-3-3563-1165  
URL <http://www.bridgestone.co.jp/english/index.html>



Run-Flat tire "POTENZA RE050"

## EC-5-013

## Automobile parts

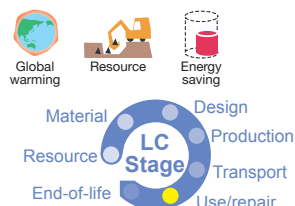
## tires for passenger cars

## POTENZA RE050 ECOPIA

## Environmental performance

POTENZA RE050 ECOPIA tires are standard equipment on the Mercedes-Benz S-Class HYBRID Long.

POTENZA RE050 ECOPIA offers the ultimate in stable driving performance in both wet and dry conditions while also achieving a reduction in rolling resistance.



POTENZA RE050 ECOPIA

## Bridgestone Corporation

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URL <http://www.bridgestone.co.jp/english/index.html>

## EC-5-014

## Automobile parts

## sheet steel

## High-strength steel for forged connecting rods

## Environmental performance

Higher performance and lighter weights of automobile engine components also contribute to reducing CO<sub>2</sub> emissions. This new material allows the two parts to be created on a single line by forging a single part and then splitting it. This helps to reduce the CO<sub>2</sub> that is produced by the production line.

## Product performance

In collaboration with Honda Motor Co., Sumitomo Metals (Kokura) has developed a revolutionary new material for use in the connecting rods that transmit the reciprocating motion of the pistons to the crankshaft. Previously, a connecting rod was composed of two components manufactured on two separate lines. However this new material allows the two parts to be created on a single line by forging a single part and then splitting it. This also reduces the weight of the part by 13% because of its improved fatigue strength.



Connecting rod and split surface

## Sumitomo Metal Industries, Ltd.

1-8-11 Harumi, Chuo-ku, Tokyo, 104-6111, Japan

Tel +81-3-4416-6183 Fax +81-3-4416-6793

E-mail [chikyu-kan@sumitomometals.co.jp](mailto:chikyu-kan@sumitomometals.co.jp)

URL <http://www.sumitomometals.co.jp>

Available in: Worldwide

Connecting rod and split surface

## EC-5-015

## Automobile parts

sheet steel

## Non-heat treated nitrocarburized high-strength crankshaft steel

## Environmental performance

This material contains titanium nitride and molybdenum, making it possible to omit the normalizing heat treatment that was previously essential in order to improve material fatigue strength and bending correction properties. This reduces the CO<sub>2</sub> emissions from the manufacturing process by 22%.

## Product performance

Sumitomo Metals (Kokura) has developed a new material for crankshafts jointly with Honda Motor Co.



## Sumitomo Metal Industries, Ltd.

1-8-11 Harumi, Chuo-ku, Tokyo, 104-6111, Japan  
 Tel +81-3-4416-6183 Fax +81-3-4416-6793  
 E-mail [chikyu-kan@sumitomometals.co.jp](mailto:chikyu-kan@sumitomometals.co.jp)  
 URL <http://www.sumitomometals.co.jp>

Available in: Worldwide



Crankshaft

Crankshaft

## EC-5-016

## Automobile parts

sheet steel

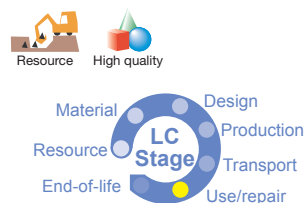
## High-strength case-hardened boron steel

## Environmental performance

However there are concerns that the world's supply of molybdenum is being depleted. A high-strength case-hardened boron steel uses boron as the additive instead of molybdenum. These products are contributing to resource saving.

## Product performance

Ordinarily, molybdenum is added to the main shaft and counter shaft (steel components) of a motorcycle transmission so that heat treatment can be used to create an extremely hard surface. We, in collaboration with Honda Motor Co., have developed a high-strength case-hardened boron steel, which uses boron as the additive instead of molybdenum.



## Sumitomo Metal Industries, Ltd.

1-8-11 Harumi, Chuo-ku, Tokyo, 104-6111, Japan  
 Tel +81-3-4416-6183 Fax +81-3-4416-6793  
 E-mail [chikyu-kan@sumitomometals.co.jp](mailto:chikyu-kan@sumitomometals.co.jp)  
 URL <http://www.sumitomometals.co.jp>

Available in: Worldwide



Main shaft (top) and counter shaft (bottom)

Main shaft (top) and counter shaft (bottom)

## EC-5-017

## Automobile parts

## aluminum wheels

## Aluminum wheels for trucks and buses

## Environmental performance

Aluminum wheels reduce vehicle weights and contribute to reducing CO<sub>2</sub> emissions.

## Product performance

Sumitomo Metals developed the first single-piece forged aluminum wheels for trucks and buses in Japan. We also supply aluminum wheels for new transportation systems and special vehicles. We are reinforcing our production system, working toward the new emissions restrictions that will take effect in 2010.



"Tough Bright" high-brightness aluminum wheels  
(30% higher luster than conventional products)

"Tough Bright" high-brightness aluminum wheels

## Sumitomo Metal Industries, Ltd.

1-8-11 Harumi, Chuo-ku, Tokyo, 104-6111, Japan  
Tel +81-3-4416-6183 Fax +81-3-4416-6793  
E-mail [chikyu-kan@sumitomometals.co.jp](mailto:chikyu-kan@sumitomometals.co.jp)  
URL <http://www.sumitomometals.co.jp>

Available in: Worldwide

## EC-5-018

## Automobile parts

## titanium mufflers

## Titanium muffler

## Environmental performance

high corrosion resistance exhaust muffler

## Product performance

Nippon Steel's titanium materials have high corrosion resistance and are used in a lot of applications: industrial use in the field of electricity and chemicals, marine structures, civil applications including sports goods and office appliances, and the field of construction materials. The titanium materials contribute to the extended service life of the finished products. For the purpose of reducing the weight of automobiles and motorcycles. Titanium is not only light in weight but also suitable for the thermal resistance required for the application temperature range of mufflers (approx. 600°C). Nippon Steel is going to further expand the application range of titanium by improving the spring characteristics and engine-sound muffling performance in addition to lightness.

## Nippon Steel Corporation

2-6-1, Marunouchi, Chiyoda-ku, Tokyo, 100-8071, Japan  
Tel +81-3-6867-2566 Fax +81-3-6867-2566  
E-mail [kankyo@nsc.co.jp](mailto:kankyo@nsc.co.jp)  
URL <http://www.nsc.co.jp/en/eco/index.html>





## EC-5-019

## Automobile parts

## alternators

## Water Cooled Alternator

## Environmental performance

Higher power generation efficiency (Approximately 7% higher than conventional model\*)  
 · The peak efficiency of this model full load generation improves to 67% compared with the peak efficiency 60% of the conventional model\* full load generation, and generates electricity by little input energy (engine fuel cost improvement).

## Product performance

Alternator (Three-phase AC generator for vehicle) can contribute to less emission and improvement in fuel consumption of the vehicle.

- (1) A compact size alternator with high output (44% higher than conventional model\*)
- (2) Higher power generation efficiency (Approximately 7% higher than conventional model\*)
- (3) Low acoustic noise (20 dB at 10,000 r/min (alternator speed) lower than conventional model\*)
- (4) Potential for applying to a variety of systems (Ex. Motorized 4WD system; one of Hitachi's other contribution for ecology)

\*Compared to LR1150-707B (air cooled, 2007)

## Hitachi Automotive Systems, Ltd.

Shin-Otemachi Building, 2-1, Otemachi 2-chome, Chiyoda-ku, Tokyo., 100-0004, Japan

Tel +81-3-4232-5300 Fax +81-3-4232-5341

URL <http://www.hitachi-automotive.co.jp/en/>

URL [http://www.hitachi-automotive.co.jp/en/vision/vision\\_07/index.html](http://www.hitachi-automotive.co.jp/en/vision/vision_07/index.html)

Available in: Japan, Europe, North America



LR945-901B

## EC-5-020

## Automobile parts

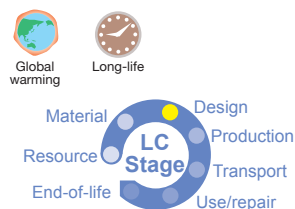
## power cable harnesses

## Power cable Harness for Hybrid Vehicles

## Environmental performance

- Sizes of cable and connection methods that are specific to individual vehicle systems and spaces are offered.
- Heat and oil resistance has been greatly improved through the use of FLUONLEX® for the insulator.
- Safety for high voltage, noise reduction, and easier installation into the car are considered.

\* FLUONLEX® is registered trademark of Hitachi Cable, Ltd.



## Hitachi Cable, Ltd.

Hitaka Works, 5-1-1 Hitaka-cho, Hitachi-shi, Ibaraki, 319-1414, Japan

Tel +81-294-25-3835 Fax +81-294-43-3852

E-mail [taketani.noriaki@hitachi-cable.co.jp](mailto:taketani.noriaki@hitachi-cable.co.jp)

URL <http://www.hitachi-cable.co.jp/en/index.html>

URL <http://www.hitachi-cable.co.jp/en/products/vehicle/eco/index.html>

URL <http://www.hitachi-cable.co.jp/en/about/publish/csr/index.html>

Power cable Harness for Hybrid Vehicles



## EC-5-021

## Automobile parts

parts for internal combustion engines

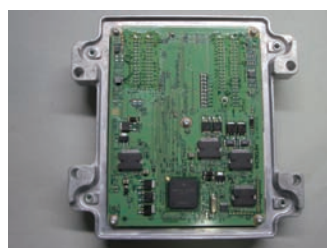
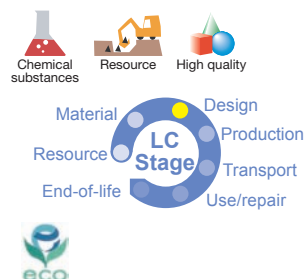
## Automobile Electronic Controller (Model No. ECS\*\_\*\*\*)

## Environmental performance

- (1) Compactness and lightweight have been achieved by applying high-density packaging.
- (2) Hazardous substances have been reduced by using lead-free soldering for mounting.

## Product performance

High-reliability electronic control unit for high reliable uses such as automobile engine control.



## Hitachi Automotive Systems, Ltd.

Shin-Otemachi Building, 2-1, Otemachi 2-chome, Chiyoda-ku, Tokyo, 100-0004, Japan  
 Tel +81-3-4232-5300 Fax +81-3-4232-5341  
 URL <http://www.hitachi-automotive.co.jp/en/>

Available in: Asia, Europe, North America

Water-proof type Engine Control Unit

## EC-5-022

## Automobile parts

parts for internal combustion engines

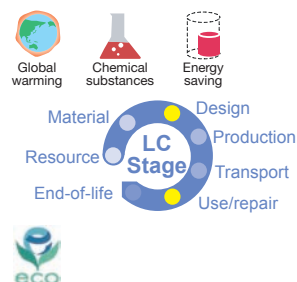
## Pulley Assy-VTC for Automobile Engines

## Environmental performance

VTC designed for continuously controlling the phase of the valve timing in automobile engines depending on the load conditions, improving the torque/fuel efficiency and emission.  
 Lightweight, compact VTC that reduces the impact on the environment by restricting the use of hazardous substances.

## Product performance

VTC shifts and controls the valve opening/closing timing of the automobile engine, utilizing the oil pressure.



## Hitachi Automotive Systems, Ltd.

Sin-Otemachi Building 2-2-1 Otemachi, Chiyoda-ku, Tokyo, 100-0004, Japan  
 Tel +81-3-4232-5300 Fax +81-3-4232-5341  
 URL <http://www.hitachi-automotive.co.jp/en/>  
 URL <http://www.hitachi-automotive.co.jp/en/products/ems/02.html>  
 URL [http://www.hitachi-automotive.co.jp/en/vision/vision\\_07/index.html](http://www.hitachi-automotive.co.jp/en/vision/vision_07/index.html)

Available in: Japan, North America

Vane type VTC

## EC-5-023

## Automobile parts

## parts for internal combustion engines

## Diesel Particulate Filter

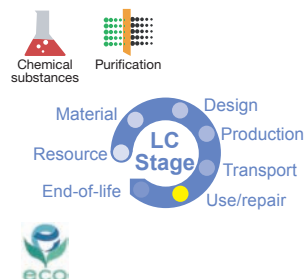
## Environmental performance

Composed of cordierite ceramics, our Diesel Particulate Filter reduces particulate matter (PM) of exhaust gas in medium- and heavy-duty diesel commercial vehicles. This environmentally conscious product functions effectively to help vehicles meet increasingly stringent exhaust gas regulations.

Our Diesel Particulate Filter has been developed through Hitachi Metals' accumulated ceramics manufacturing technologies. Our unique filter with an optimal pore structure, size and distribution demonstrates both low-pressure loss characteristics to contribute to lower fuel consumption and high PM trapping performance, enabling the capture of micro-particles as small as 10nm.

## Hitachi Metals, Ltd.

SEAVANS North Building, 1-2-1, Shibaura, Minato-ku, Tokyo, 105-8614, Japan  
Tel +81-3-5765-4512  
E-mail [hmcc@hitachi-metals.co.jp](mailto:hmcc@hitachi-metals.co.jp)  
URL <http://www.hitachi-metals.co.jp/e/index.html>  
URL [http://www.hitachi-metals.co.jp/e/prod/prod06/p06\\_09.html](http://www.hitachi-metals.co.jp/e/prod/prod06/p06_09.html)  
URL [http://www.hitachi-metals.co.jp/e/corp/corp14\\_01.html](http://www.hitachi-metals.co.jp/e/corp/corp14_01.html)



Diesel Particulate Filter

## EC-5-024

## Automobile parts

## parts for driving, transmission, and operating components

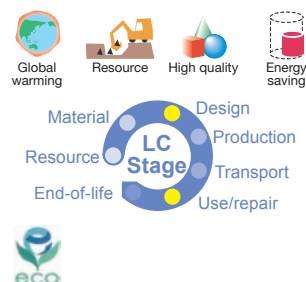
## Variable Displacement Pump for Automobile Power Steering

## Environmental performance

- Fuel consumption is reduced by about 1.5% by reducing driving torque of pump.
- Pump displacement is controlled appropriately according to engine revolution speed.
- Cooling piping is simplified with increased reliability by decreasing the oil temperature in the system.

## Product performance

This hydraulic power steering pump driven by engine power is a Variable Displacement Pump, of which flow rate can be controlled according to the engine speed.



## Hitachi Automotive Systems, Ltd.

Sin-Otemachi Building 2-2-1 Otemachi, Chiyoda-ku, Tokyo, 100-0004, Japan  
Tel +81-3-4232-5300 Fax +81-3-4232-5341  
URL <http://www.hitachi-automotive.co.jp/en/>  
URL <http://www.hitachi-automotive.co.jp/en/products/dcs/04.html#p02>  
URL [http://www.hitachi-automotive.co.jp/en/vision/vision\\_07/index.html](http://www.hitachi-automotive.co.jp/en/vision/vision_07/index.html)

Available in: Japan, Europe, North America

## EC-5-025

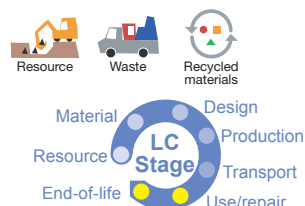
## Automobile parts

parts for driving, transmission, and operating components

## Rebuilt alternator

## Environmental performance

A remanufactured alternator is produced through the process of disassembling used units, cleaning and re-assembling after testing. Usable components from the first-made product will be used as many as possible, so it will minimize the use of new components. You can save a tremendous amount of raw materials and energy used for the production of new components by using a remanufactured alternator.



## SHIN ETSU DENSO CO., LTD.

2656-210 Taira Omachi, Nagano, 398-0001, Japan  
 E-mail [shine@shine-reman.com](mailto:shine@shine-reman.com)  
 URL <https://www.shine-reman.com>

Available in: Japan, Worldwide

## EC-5-026

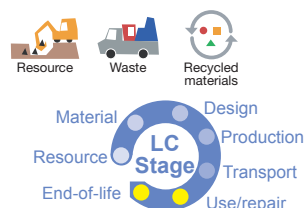
## Automobile parts

parts for driving, transmission, and operating components

## Rebuilt starter

## Environmental performance

A remanufactured starter is produced through the process of disassembling used units, cleaning and re-assembling after testing. Usable components from the first-made product will be used as many as possible, so it will minimize the use of new components. You can save a tremendous amount of raw materials and energy used for the production of new components by using a remanufactured starter.



## SHIN ETSU DENSO CO., LTD.

2656-210 Taira Omachi, Nagano, 398-0001, Japan  
 Tel +81-261-232788 Fax +81-261-233906  
 E-mail [shine@shine-reman.com](mailto:shine@shine-reman.com)  
 URL <https://www.shine-reman.com>

Available in: Japan, Worldwide

## EC-5-027

## Automobile parts

parts for driving, transmission, and operating components

## Energy Saving Electrical Power Steering (Motor and Controller)

## Environmental performance

----&lt;&lt; M : Material·Resource saving &gt;&gt;----

Compact size and High power Motor/Controller contributes to the design of light weight vehicles.

----&lt;&lt; E : Energy·Energy saving &gt;&gt;-----

Consumes energy only when the steering wheel is being turned, this improves a vehicle's fuel consumption efficiency.

-----&lt;&lt; Long life &gt;&gt;-----

Maintenance free

## Product performance

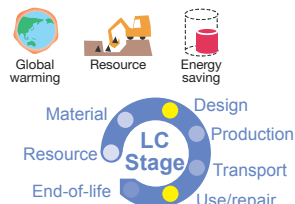
The electric power steering system assists the driver in steering only when the steering wheel is being turned; hence it serves to improve fuel economy by 3 to 5% compared with the conventional hydraulic power steering system. The compact yet high-power motor has realized system lineups for a full range from light motor vehicles up to oversized vehicles. It has its original control algorithm that creates excellent steering feeling and stability.

## Mitsubishi Electric Corporation

2-7-3, Marunouchi, Chiyoda-ku, Tokyo, 100-8310, Japan

Tel +81-3-3218-9024 Fax +81-3-3218-2465

E-mail eqd.eco@pj.MitsubishiElectric.co.jp

URL <http://global.mitsubishielectric.com/index.html>URL <http://global.mitsubishielectric.com/company/csr/environment/products/index.html>URL <http://global.mitsubishielectric.com/company/csr/index.html>

Motor for Electrical Power Steering

Eco-components // Automobile parts

1  
2  
3  
4  
5  
6  
7

## EC-5-028

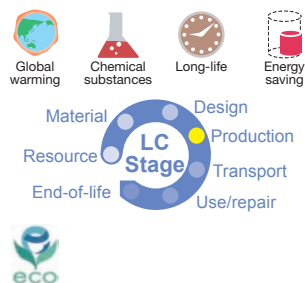
## Automobile parts

rubber hoses

## Brake Hose

## Environmental performance

- Long life is achieved by developing new materials and re-designing the structure.
- A new forged manufacturing method of metal fittings is developed which eliminates material loss and reduces energy consumption.
- Adoption of new surface treatment that doesn't use hexavalent chromium.



## Hitachi Cable, Ltd.

Hitaka Works, 5-1-1 Hitaka-cho, Hitachi-shi, Ibaraki, 319-1414, Japan

Tel +81-294-25-3835 Fax +81-294-43-3852

E-mail [taketani.noriaki@hitachi-cable.co.jp](mailto:taketani.noriaki@hitachi-cable.co.jp)URL <http://www.hitachi-cable.co.jp/en/index.html>URL <http://www.hitachi-cable.co.jp/en/products/rubber/index.html>URL <http://www.hitachi-cable.co.jp/en/about/publish/csr/index.html>

Brake hose

## EC-5-029

## Automobile parts

## auxiliary brake

## Neotard™ Retarder

## Environmental performance

As many of these retarders are lightweight and compact, they contribute to consuming extremely little energy. Also by reducing the amount of hazardous substances such as brake lining wear particles, they make a large contribution to preserving the Earth's environment.

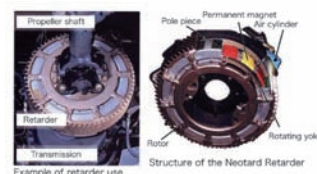
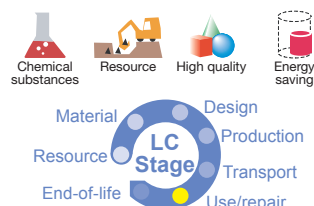
## Product performance

This retarder is an auxiliary brake used in large trucks, buses, and similar vehicles. It is a product that reduces hazardous substances such as brake lining wear particles, and supports safety and riding comfort. The Sumitomo Metals retarder, Neotard Retarder™, is a permanent magnet eddy current braking system that utilizes the world's most powerful neodymium permanent magnet to generate braking force.

## Sumitomo Metal Industries, Ltd.

1-8-11 Harumi, Chuo-ku, Tokyo, 104-6111, Japan  
Tel +81-3-4416-6183 Fax +81-3-4416-6793  
E-mail [chikyu-kan@sumitomometals.co.jp](mailto:chikyu-kan@sumitomometals.co.jp)  
URL <http://www.sumitomometals.co.jp>

Available in: Worldwide



Example of retarder use

## EC-5-030

## Automobile parts

## parts for motor vehicles/motorcycles

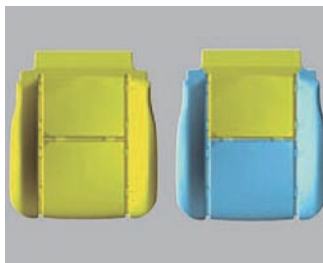
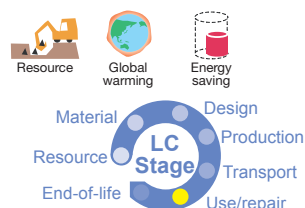
## Seat Pad with Different Density but Usual Hardness

## Environmental performance

We conventionally reduce the weight of seat pads with a lightweight formulation, but this sometimes reduces ride comfort and durability. Bridgestone has developed a seat with the usual hardness but less density with reduced weight without compromising ride comfort. This advantage is realized not only through high-performance formulation of the base parts that are important for ride comfort, but also through the adoption of a lightweight formulation for other parts, without reducing the weight of the whole seat pad.

## Bridgestone Corporation

1-6-6, Yaesu, Chuo-ku, Tokyo, 103-0028, Japan  
Tel +81-3-5202-6959 Fax +81-3-5202-8173  
URL <http://www.bridgestone.co.jp/english/index.html>



The same hardness and different density seat pad

EC-5-031

Automobile parts

parts for motor vehicles/motorcycles

## High-efficiency crash box

### Environmental performance

This product contributes to reducing vehicle body weight and CO<sub>2</sub>.

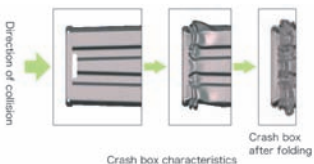
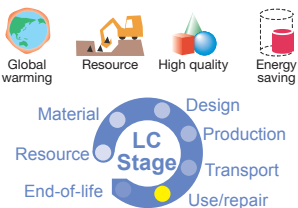
### Product performance

A crash box is a component located at the front of an automobile that folds like an accordion to lessen the impact in the event of a collision. Sumitomo Metals has designed a lightweight crash box with a structure that delivers more than twice the energy absorption capability of conventional products. This product contributes to reducing vehicle body weight, and is used in the Toyota Vitz, Mazda Atenza, and other models.

### Sumitomo Metal Industries, Ltd.

1-8-11 Harumi, Chuo-ku, Tokyo, 104-6111, Japan  
Tel +81-3-4416-6183 Fax +81-3-4416-6793  
E-mail [chikyu-kan@sumitomometals.co.jp](mailto:chikyu-kan@sumitomometals.co.jp)  
URL <http://www.sumitomometals.co.jp>

Available in: Worldwide



Crash box characteristics

## EC-6-001

## Packaging

beverage

## PET bottle based on universal design for environment load reduction

## Environmental performance

PET bottle with hollow surface and thermal adhesion label  
Hollow bottle reduced the used quantity of resin by 21%. Its feature is that it is easy to hold and to pour. It is being used as the bottle of the tea drink for a famous brand. The thermal adhesion label can be thermally stuck at only one spot after it is wound up on the body of the bottle. It can reduce the used amount of label by 22% compared to conventional. The label is easy to be stripped, and it is expected to promote the classification and discharge of the bottle.

Asahi Soft Drinks Co., Ltd. contributes to the realization of rich, healthy eating habits of the consumers, through various company activities aimed at passing the earth on to the next generation in a healthier state.



Juroku-Cha PET

## Asahi Soft Drinks Co., Ltd.

1-23-1 Azumabashi, Sumida-ku, Tokyo, 130-8602, Japan  
Tel +81-3-5608-7227 Fax +81-3-5608-7248

## EC-6-002

## Packaging

beverage

## PET bottle using biomass plastic label

## Environmental performance

Asahi Soft Drinks Co., Ltd. introduced the eco-friendly "biomass label" on 500ml Juroku-cha PET bottles. Using 50% or more plant-derived polylactic acid made from corn starch, it is the first soft drink PET bottle label to attain the "biomass plus mark." As the labels reduce the use of fossil fuel resources, CO<sub>2</sub> emissions can be limited. Compared with conventional labels, approximately 283 tons of CO<sub>2</sub> per year will be reduced. This product won the Beverage Packaging Category Award of the Japan Packaging Contest. Asahi Soft Drinks Co., Ltd. contributes to the realization of rich, healthy eating habits of the consumers, through various company activities aimed at passing the earth on to the next generation in a healthier state.



Juroku-Cha PET

## Asahi Soft Drinks Co., Ltd.

1-23-1 Azumabashi, Sumida-ku, Tokyo, 130-8602, Japan  
Tel +81-3-5608-7227 Fax +81-3-5608-7248



## EC-6-003

## Packaging

beverage

## Plant-based raw materials used for plastic bottles that are 100% recyclable by conventional means

## Environmental performance

Some parts of Plant Bottle™ are produced using plant-based raw materials, reducing the degree of dependence on the depletable resource of oil. In addition, this kind of plastic bottle can be 100% recycled at recycling factories in the same way as conventional bottles. Use of the bottles is expected to cut the consumption of 1,353 kl of oil per year, an amount equivalent to 301 kl of gasoline (\*2), which would be enough to allow a car (fuel consumption: 10 km per liter) to drive 75 times around the earth (\*3).

\*1) Value estimated by multiplying the total amount of oil contained in 1-ton of PET resins by the estimated sales volume of Sokenbi-tea in 2009. Source: LCI Data Report on Petrochemical Products (updated version) published by Plastic Waste Management Institute, March 2009, Guidelines for National Greenhouse Gas Inventories; Report Manual Ver. 2.4 (Ministry of the Environment, Ministry of Economy, Trade and Industry, March 2009) \*2) Source: Oil Handbook, Figure 41. Shift of production yield ratio by petroleum products from the website of Nippon Oil Corp. \*3) Trial calculation based on the supposition that the length around the earth is 40,000 km Source: URL of Japan Aerospace Exploration Agency



## Coca-Cola Japan Company Limited

6-3, Shibuya 4Cho-me, Shibuya-ku, Tokyo, 150-0002, Japan  
Tel +81-3-5466-8120 Fax +81-3-3797-1481  
URL <http://www.cocacola.co.jp/>  
URL <http://sokenbicha.jp/>

Available in: Japan

## EC-6-004

## Packaging

beverage

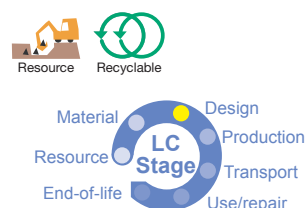
## I LOHAS

## Environmental performance

I LOHAS is delicious natural water obtained from carefully chosen regions that are famous for their water. The product employs a 12g PET bottle called the "eco-ru bottle Shiboru" (520ml) - the lightest in Japan(\*) that uses less plastic resin per container. It has not only a reduced impact on the environment, but also expected to save space because it requires little strength to make it compact after consumption by twisting the container to crush it.

This delicious water product is unique in offering consumers a simple form of environmental action, where they can enjoy the great taste of Japanese natural spring water, then twist the bottle to crush it for recycling

\* Based on a survey conducted by Coca-Cola (Japan) Co., Ltd. regarding 500ml PET bottles manufactured in Japan (as of March 2009)



エコ商品  
ねと掲載



## Coca-Cola Japan Company Limited

6-3, Shibuya 4Cho-me, Shibuya-ku, Tokyo, 150-0002, Japan  
Tel +81-3-5466-8120 Fax +81-3-3797-1481  
URL <http://www.cocacola.co.jp/>  
URL <http://i-lohas.jp/>

Available in: Japan

I LOHAS

## EC-6-005

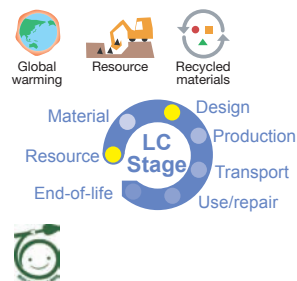
## Packaging

beverage for baby &amp; kids

## Paper container "Cartocan" using the forest thinning material

## Environmental performance

Wakodo Co., Ltd. has acquired the public mark for "Forest Thinning Material" on its paper container "Cartocan," because it uses more than 30% domestic wood comprising forest thinning materials greater than 10%. Through the positive use of domestically obtained wood, some of the expense to repair local forests is fed back to the mountains, thus promoting a healthier forest. This activity coincides with a national project the Japan Forest Agency is promoting: "National campaign to promote the making of beautiful woods" and "The campaign to use domestic wood." This is helping the construction of a recycling society and the absorption of CO<sub>2</sub>. Beverages sold include a 125 ml pack for children, including Genkicchi, the caffeine-free blended tea "Juroku-Cha," and an organic drink (fruit & vegetables plus carrot).



## Wakodo Co., Ltd.

2-14-3 Kanda Tsukasa-machi, Chiyoda-ku, Tokyo, 101-0048, Japan  
Tel +81-3-5296-6815 Fax +81-3-5296-6808



Beverage for baby &amp; kids 125ml pack ( 7 items )

## EC-6-006

## Packaging

paper beverage containers

## Cartocan

## Environmental performance

The Cartocan uses domestic lumber, including wood from forest-thinning, for over 30% of its raw materials and thus contributes to the prevention of global warming by helping to nurture healthy forests. Using domestic lumber advances domestic forest development and contributes to achieving Japan's target of reducing CO<sub>2</sub> emissions by 6% as stipulated in the Kyoto Protocol.

## Product performance

An aseptic filling system is used and deterioration due to heat is minimal, meaning that the content's original quality is not lost. Toppan GL Film is used for the barrier layer. GL Film has outstanding barrier properties, enabling distribution at ambient temperatures and stable content conservation. The Cartocan has a cylindrical shape that can be held easily even by small hands and overflow of the content is minimized.



## TOPPAN PRINTING CO., LTD.

1, Kanda Izumi-cho, Chiyoda-ku, Tokyo, 101-0024, Japan  
Tel +81-3-3835-5549 Fax +81-3-3835-0847  
E-mail [eco@toppan.co.jp](mailto:eco@toppan.co.jp)  
URL <http://www.toppan.co.jp/english/>  
URL <http://www.toppan.co.jp/english/csr/>



Cartocan paper beverage container with special Toyako Summit design

## EC-6-007

## Packaging

## plastic cups

## Beaubelcup® - Light

## Environmental performance

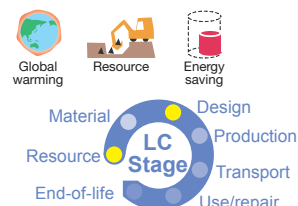
DNP has developed the lightest Injection Molded Cup 9.8g in the world, called "Beaubel Cup Air", which was already adopted for Chilled Beverage Cup.

DNP achieved 5.0 g reduction, that is, 33% resin weight reduction per a cup, compared to the conventional light weight Beaubel Cup 14.8 g.

"Beaubel Cup Air" has no longer rigid feeling but soft with necessary strength as an original plastic cup.

<Major applications>

Beverages, desserts.



## Dai Nippon Printing Co., Ltd.

1-1-1, Ichigaya-Kagacho, Shinjuku-ku, Tokyo, 162-8001, Japan

## EC-6-008

## Packaging

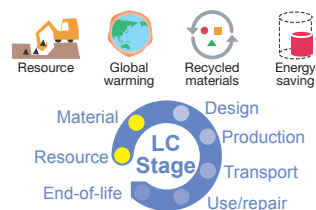
## aluminum beverage cans

## Aluminum Beverage Cans made from Used Beverage Cans

## Environmental performance

The aluminum beverage can is made up of a can body and a can end. Universal Can Corporation (hereinafter called "UNICAN") has been in the aluminum can business for over 35 years. Our aluminum beverage cans include UBCs (used beverage cans), which account for over 50% of the total weight of aluminum can bodies. (Certified according to "EPD" Environmental Labels Type III). Recycling aluminum from UBCs uses 97% less energy than making new aluminum from bauxite. Usage of more UBCs and less new virgin metal will contribute to saving bauxite and energy and the prevention of global warming. Mitsubishi Materials Group including UNICAN has established a unique integrated recycling process which consists of retrieving UBCs, pouring recycled aluminum into long ingots and producing can body stocks. This process can help "the Can to Can cycle" function more effectively.

\* We obtained "ECO LEAF" certification (310B, 315B, 410B and 250, 350, 500ml sizes).



## Universal Can Corporation

Sumitomofudosan-Korakuen Bldg., Koishikawa1-4-1, Bunkyo-ku, Tokyo, 112-8525, Japan

Tel +81-3-3868-7470 Fax +81-3-3868-7467

URL <http://www.unican.co.jp/>

## EC-6-009

## Packaging

## beverage filling systems

## Synchronized aseptic filling system

## Environmental performance

This is an aseptic system that enables the filling of light PET bottles that have no heat resistance at normal temperatures in place of heavy heat-resistant PET bottles designed for hot filling.

The technique represents a low-cost, environmentally friendly system that has integrated processes from blow molding to filling by making effective use of the residual heat from blow molding to sterilize bottles.

The system has enabled a reduction in the weight of bottles and the use of bottles with improved design characteristics, thereby significantly cutting the amount of energy used.

Scope of reduction

Installation space : Reduced by 50percent

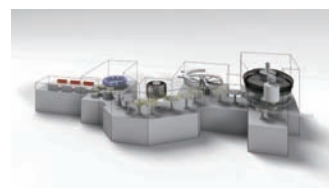
Utility used : Reduced by 50percent

<Major applications>

Beverages

## Dai Nippon Printing Co., Ltd.

1-1-1, Ichigaya-Kagacho, Shinjuku-ku, Tokyo, 162-8001, Japan



## EC-6-010

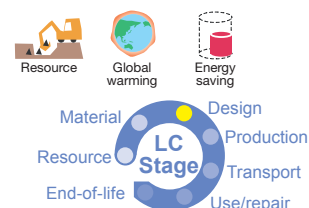
## Packaging

## beer

## Can beer using a light can

## Environmental performance

With the Asahi Breweries, Ltd., we are working on the lightweighting of the can to be used with beer. In 2006, we reduced the weight of aluminum to be used per 1 liter of beer, by 10.6% at the ratio of 1990. Asahi Breweries is committed to developing environmentally friendly containers and packaging while promoting the 3 Rs (Reduce, Reuse and Recycle) toward the establishment of a recycling-oriented society.



## Asahi Breweries, Ltd.

1-23-1 Azumabashi, Sumida-ku, Tokyo, 130-8602, Japan

Tel +81-3-5608-5195 Fax +81-3-5608-5201

URL <http://www.asahibeer.co.jp/english/>



Asahi Super Dry 350ml, 500ml

## EC-6-011

## Packaging

beer

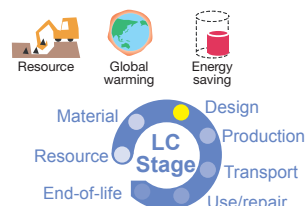
## Beer in 206-diameter SuperEnd next-generation lightweight-end cans

## Environmental performance

Asahi Breweries, Ltd. is introducing efforts to reduce the weight of beer-can ends. In 2007, the company reduced the surface area of these ends by approx. 6% and their thickness by 0.01 mm through the introduction of 206-diameter SuperEnd next-generation lightweight ends featuring an exclusive countersink wall. This design reduces aluminum consumption by about 9% compared with the conventional model (approx. 0.3 g per end). Using this type of end for beer cans will save approx. 1,200 tons of aluminum annually and reduce CO<sub>2</sub> emissions by about 9,000 tons per annum. Asahi Breweries is committed to developing environmentally friendly containers and packaging while promoting the 3 Rs (Reduce, Reuse and Recycle) toward the establishment of a recycling-oriented society.

## Asahi Breweries, Ltd.

1-23-1 Azumabashi, Sumida-ku, Tokyo, 130-8602, Japan  
Tel +81-3-5608-5195 Fax +81-3-5608-5201  
URL <http://www.asahibeer.co.jp/english/>



Asahi Super Dry

## EC-6-012

## Packaging

beer

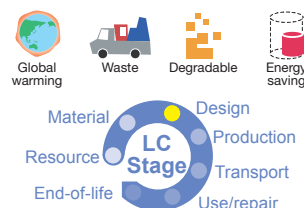
## A beer-keg cap made from polylactic acid (a plant-derived plastic)

## Environmental performance

Asahi Breweries, Ltd. is introducing efforts to develop environmentally friendly containers and packaging materials. This product is a cap seal that protects the mouthpiece of kegs, and is made from polylactic acid (a plant-derived plastic). It is used for stainless kegs that contain beer and RTD, and is manufactured using a type of plant-derived plastic that has no petroleum content in its raw materials and is biodegradable. This is the world's first cap seal to be introduced for keg products. CO<sub>2</sub> emissions in the product cycle, from raw materials to manufacturing and disposal, will be reduced by approximately 60%, which amounts to about 150 tons per year. Asahi Breweries is committed to developing environmentally friendly containers and packaging while promoting the 3 Rs (Reduce, Reuse and Recycle) toward the establishment of a recycling-oriented society.

## Asahi Breweries, Ltd.

1-23-1 Azumabashi, Sumida-ku, Tokyo, 130-8602, Japan  
Tel +81-3-5608-5195 Fax +81-3-5608-5201  
URL <http://www.asahibeer.co.jp/english/>



Asahi Super Dry

## EC-6-013

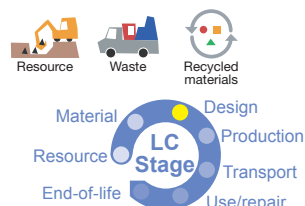
## Packaging

wine

## Wine in lightweight Ecology Bottles

## Environmental performance

Asahi Breweries, Ltd. is introducing efforts to reduce amounts of waste containers and packaging materials and to promote recycling in order to save resources. This product uses a lightweight wine bottle called the Ecology Bottle, which uses more than 90% recycled glass. It maintains the same height as existing wine bottles, but its weight is reduced by approx. 18%. CO<sub>2</sub> emissions during the model's manufacture are reduced by approx. 180 tons per year, and the resulting enhancements in transportation efficiency have also led to reduced CO<sub>2</sub> emissions. Asahi Breweries is committed to developing environmentally friendly containers and packaging while promoting the 3 Rs (Reduce, Reuse and Recycle) toward the establishment of a recycling-oriented society.



Sainte Neige Wine

## Asahi Breweries, Ltd.

1-23-1 Azumabashi, Sumida-ku, Tokyo, 130-8602, Japan  
Tel +81-3-5608-5195 Fax +81-3-5608-5201  
URL <http://www.asahibeer.co.jp/english/>

## EC-6-014

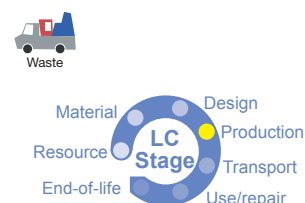
## Packaging

can

## Mixed Congee

## Environmental performance

We safeguard the environment as follows.  
This product has obtained the Green Mark in recognition of our efforts for recycling.  
The product waste material is recycled and used for efficient purposes.  
This is our view of positive environmental effects, which assures the consumer on the credibility of our products.



## TAISUN ENTERPRISE CO., LTD.

NO.788, SEC.1, YUAN-CHIRD, TEN-CHUNG JEN, CHANG-HUA SHIEN,  
TAIWAN, R.O.C. 520  
Tel +886-4-8742211 ext 306 Fax +886-4-8752829  
E-mail [jeky@taisun.com.tw](mailto:jeky@taisun.com.tw)

Available in: Japan, Asia, North America



EC-6-015

Packaging

can

## Peanut soup

### Environmental performance

We safeguard the environment as follows.

This product has obtained the Green Mark in recognition of our efforts for recycling.

The product waste material is recycled and used for efficient purposes.

This is our view of positive environmental effects, which assures the consumer on the credibility of our products.



### TAISUN ENTERPRISE CO., LTD.

NO.788, SEC.1, YUAN-CHIRD, TEN-CHUNG JEN, CHANG-HUA SHIEN,  
TAIWAN, R.O.C. 520  
Tel +886-4-8742211 ext 306 Fax +886-4-8752829  
E-mail jeky@taisun.com.tw

EC-6-016

Packaging

can

## Peanut milk

### Environmental performance

We safeguard the environment as follows.

This product has obtained the Green Mark in recognition of our efforts for recycling.

The product waste material is recycled and used for efficient purposes.

This is our view of positive environmental effects, which assures the consumer on the credibility of our products.



### TAISUN ENTERPRISE CO., LTD.

NO.788, SEC.1, YUAN-CHIRD, TEN-CHUNG JEN, CHANG-HUA SHIEN,  
TAIWAN, R.O.C. 520  
Tel +886-4-8742211 ext 306 Fax +886-4-8752829  
E-mail jeky@taisun.com.tw



EC-6-017

Packaging

can

## Red Yeast Rice With Mixed Congee

## Environmental performance

We safeguard the environment as follows.

This product has obtained the Green Mark in recognition of our efforts for recycling.

The product waste material is recycled and used for efficient purposes.

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E-mail jeky@taisun.com.tw

EC-6-018

Packaging

can

## Okinawa Brown Sugar With Mixed Congee

## Environmental performance

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EC-6-019

Packaging

package

## Peanut Soybean Curd Jelly

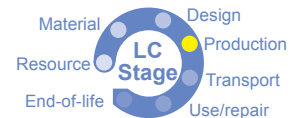
### Environmental performance

We safeguard the environment as follows.

This product has obtained the Green Mark in recognition of our efforts for recycling.

The product waste material is recycled and used for efficient purposes.

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E-mail jeky@taisun.com.tw



EC-6-020

Packaging

package

## Honey Herbal Jelly

### Environmental performance

We safeguard the environment as follows.

This product has obtained the Green Mark in recognition of our efforts for recycling.

The product waste material is recycled and used for efficient purposes.

This is our view of positive environmental effects, which assures the consumer on the credibility of our products.



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EC-6-021

Packaging

paper trays

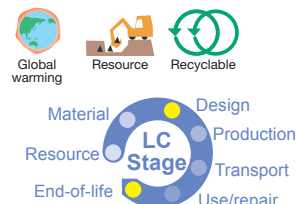
Ecocal<sup>®</sup> tray

## Environmental performance

The use of specially laminated release base paper enables the easy removal of the carton's inner film after use, making it easy to separate for disposal. The contents do not touch the carton directly, thus keeping it clean and making recycling of the paper possible.

## &lt;Major applications&gt;

Prepared daily dishes, boxed meals



## Dai Nippon Printing Co., Ltd.

1-1-1, Ichigaya-Kagacho, Shinjuku-ku, Tokyo, 162-8001, Japan



EC-6-022

Packaging

paper food packaging containers

## TicTob HealthyPack

## Environmental performance

Made from long term sustainable renewable fibre obtained from trees that are from reforestation plantations, minimizing cutting of virgin forest and sustaining natural habitat of animals, insects, water and land. Reforestation plantations are earth's long-term sustainable, natural, oxygen factories converting carbon dioxide into oxygen. Post consumer recyclable and degradable. No emission of ODS during incineration.

## Product performance

Design advantages include keep warm efficiency, safety interlocking efficiency and super compression strength for mass catering deliveries. Technological advantages include high speed cooking during microwave cooking reducing energy usage as well as maintaining maximum succulence of food textures.

Award winner of AsiaStar: Beijing / Tokyo and WorldStar USA.

## Microwave Packaging Singapore Pte Ltd

Blk 196 Pandan Loop. #07-24 Pantech Industrial Complex, 128384, Singapore

Tel +65-93841829 Fax +65-6775 2719

E-mail leonard@microwave-packaging.com

URL www.microwave-packaging.com



Available in: Singapore

EC-6-023

Packaging

polylactic acid

## PLA paper cup

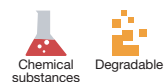
## Environmental performance

- 100% biodegradable & compostable and environmentally friendly
- Harmless to the human body

## Product performance

High-quality virgin pulp products  
Various colors, sizes, and designs, superior printing quality

- Coffee & fast food stores - Take out stores (Beverages, ice cream, etc)



## HANCHANG PAPER CO., LTD.

EXCON VENTURE BLDG., 15-24, YEOUIDO-DONG, YOUNGDEUNGPO-GU,  
SEOUL, 150-969, KOREA  
Tel +82-2-3774-5484 Fax +82-2-3774-5487  
E-mail wonchoong@hanchangpaper.co.kr  
URL www.hanchangpaper.co.kr



Pla Paper Cup

EC-6-024

Packaging

polylactic acid

## PLA-coated cupboard

## Environmental performance

- 100% biodegradable & compostable and environmentally friendly
- Harmless to the human body, instead of PE coating

## Product performance

High-quality virgin pulp products  
Various colors, sizes, and designs, superior printing quality

Paper cup manufacturer



## HANCHANG PAPER CO., LTD.

EXCON VENTURE BLDG., 15-24, YEOUIDO-DONG, YOUNGDEUNGPO-GU,  
SEOUL, 150-969, KOREA  
Tel +82-2-3774-5484 Fax +82-2-3774-5487  
E-mail wonchoong@hanchangpaper.co.kr  
URL www.hanchangpaper.co.kr



EC-6-025

Packaging

plastic

## Eco-Packaging from Biomass+ Oxo-biodegradable Technology

## Environmental performance

Winrigo is the first to introduce 2 technology - Bio-mass + Oxo-biodegradable technology into the Eco-packaging world. It is carbon natural and help mitigation of the global warming and contribute to reduce the consumption of fossil resources. Is also biodegradable as Oxo-biodegradable the balance of Polymer in the content of the packaging. It help to save the environment by reduce thickness, using recycle plastics, clear, strong and eco-friendly to meet the environment and green purchasing policy of customer. It also has excellent barrier properties to oxygen and aroma. The barrier properties is even higher than that of Aluminium, which is not as environmental friendly.

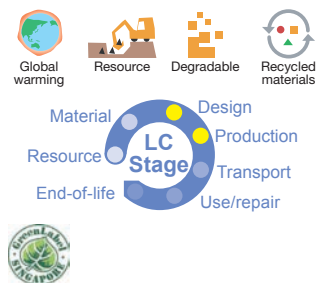
## Product performance

Sustainable manufacturing  
Clear  
Easy colouring  
eco-function  
Cost competitive  
mechanical properties of normal polymer  
recyclable  
Excellent barrier properties.

## WINRIGO (S) PTE LTD

No 21 Toh Guan Road East #04-09 Toh Guan Centre, 608609, Singapore  
Tel +65-63101396 Fax +65-65154557  
E-mail [salewin@singnet.com.sg](mailto:salewin@singnet.com.sg)  
URL [www.winrigo.com.sg](http://www.winrigo.com.sg)  
URL [www.winrigo.com.sg](http://www.winrigo.com.sg)  
URL [www.winrigo.com.sg](http://www.winrigo.com.sg)

Available in: Worldwide



Eco-packaging from Bio-mass and Oxo-biodegradable Technology

EC-6-026

Packaging

biodegradable containers

## Environment-friendly biodegradable containers

## Environmental performance

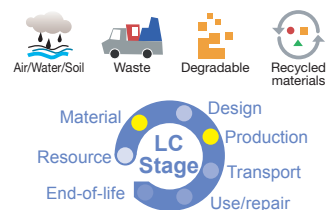
- Prevention against environmental pollution: As it is a nature-friendly circulation approach that uses a material obtained from nature and which returns to nature upon disposal, it helps prevent global warming with very little environmental load.
- Safety: Since a non-toxic natural material (corn starch) is used, it does not release harmful hormones or other substances into the environment.
- Economic efficiency: Saves expense compared to wood pulp products, and contributes to reduced use of petroleum resources.
- Environmental preservation: Does not discharge hazardous gases upon incineration, and can extend the life span of the incinerator since no clinker slag occurs.

## Product performance

Fast food packaging containers like hamburger packaging, etc.  
Disposable cups, case for packaging, ice cake containers, lunch boxes, fruit containers, etc.

## Korea UB Clean Co, Ltd.

459-11, Gilseong-ri, Hyangnam-myeon, Hwaseong-si, Gyeonggi-do, 445-921, Republic of Korea  
Tel +82-1600-1649 Fax +82-359-9177  
E-mail [ub@kubc.co.kr](mailto:ub@kubc.co.kr)  
URL [www.kubc.co.kr](http://www.kubc.co.kr)



Available in: Japan, Oceania, Europe, North America, Republic of Korea, China

Food, fruit tray and lunch box. etc

EC-6-027

Packaging  
films

## Lighter gauged EC laminates

## Environmental performance

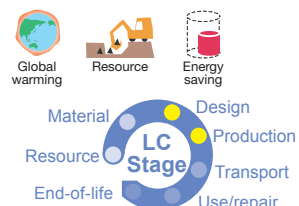
The adoption of a special resin enables a reduction in the weight of laminate film that needs to be used while maintaining its functions. Since the thickness of extruded laminated resin can be reduced to 5 micrometer, the weight of packing materials used can be minimized, thus mitigating environmental burdens. Non-anchor coated laminates are also applicable depending on material composition.

## &lt;Major applications&gt;

Outer packing of snacks, candy and chewing gum, chazuke toppings

## Dai Nippon Printing Co., Ltd.

1-1-1, Ichigaya-Kagacho, Shinjuku-ku, Tokyo, 162-8001, Japan



EC-6-028

Packaging  
films

## Refill pouch (ELBOW®)

## Environmental performance

The use of a flexible pouch for refills allows the volume of such containers to be reduced by folding after consumption of the contents, and also promotes the reuse of the original bottle. To make refilling easier, changes have also been made to the shape of the pouch mouth and the rib design for pouring stability.

## &lt;Major applications&gt;

Liquid detergent, shampoo, conditioner, cosmetics, spray deodorant



## Dai Nippon Printing Co., Ltd.

1-1-1, Ichigaya-Kagacho, Shinjuku-ku, Tokyo, 162-8001, Japan

## EC-6-029

Packaging  
films

## IB-Film®

## Environmental performance

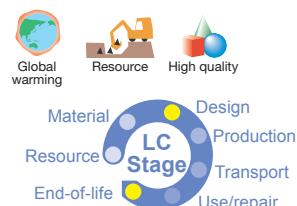
IB-film is a transparent film with high barrier performance as an oxygen and moisture barrier. It is made by depositing aluminum oxide and silicon oxide onto polyester and nylon films. Its transparency, high barrier features and suitability for printing make it useful as a base material for packaging. IB-film allows the elimination of layers (such as aluminum foil), aluminum vapor deposition and other plastic films with barrier capability. This reduces the weight of packing materials, thus contributing to a reduction of the environmental burden it creates. And It can be used for heating in microwaves, thus enhancing convenience.

## &lt;Major applications&gt;

Food, snacks, beverages, drugs, medical materials, industrial materials, packaging materials

## Dai Nippon Printing Co., Ltd.

1-1-1, Ichigaya-Kagacho, Shinjuku-ku, Tokyo, 162-8001, Japan



## EC-6-030

Packaging  
films

## Clear high barrier film : GL and GX Film

## Environmental performance

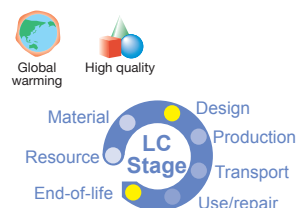
GL and GX Film are collective names for Toppan's clear high barrier films developed using coating and deposition technologies. Since these films do not use chlorine-based resins, no chlorine gases are released on incineration. When they are used as packaging material, the high barrier properties preserve contents and best before and sell by dates can be extended. This therefore contributes to reducing waste from products that have passed their use or sell by dates. It is also possible to reduce waste because the packaging material itself is rationalized and reduced in volume.

## Product performance

GL and GX Films have outstanding barrier properties and stability achieved through original deposition processing technologies. They hold the top share of the global market and are used widely for various applications including food packaging, toiletries, electrical components. (As of the end of FY2009)

## TOPPAN PRINTING CO., LTD.

1-5-1 Taito, Taito-ku, Tokyo, 101-0024, Japan  
Tel +81-3-3835-5549 Fax +81-3-3835-0847  
E-mail [eco@toppan.co.jp](mailto:eco@toppan.co.jp)  
URL <http://www.toppan.co.jp/english/>  
URL <http://www.toppan.co.jp/english/csr/>



GL and GX clear high barrier films



## EC-6-031

## Packaging

seal label

## Earth-conscious linerless seal label, Non-Sepa (R)

## Environmental performance

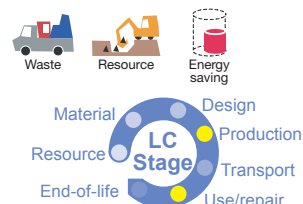
Non-Sepa (linerless) labels use no backing papers even during the production process.

Since no waste backing is left behind, the amount of paper used and CO<sub>2</sub> emissions are reduced.

## Product performance

Disposal time and cost are reduced. In addition, roughly 40% more labels are in each roll compared with a standard roll of the same diameter, while work efficiency is improved and spaces for stock and transportation costs can be cut.

Sato's Ecomatch series promotes the 3Rs (Reduce, Reuse, Recycle) , and supports customers conducting environmental conservation activities.



## SATO CORPORATION

9-10, Ebisu 4-chome, Shibuya-ku, Tokyo, 150-0013, Japan

E-mail [sales@satogbs.com](mailto:sales@satogbs.com)

URL [www.satoworldwide.com](http://www.satoworldwide.com)

Available in: Japan, Asia, Oceania, Europe, North America

## EC-6-032

## Packaging

food boxes

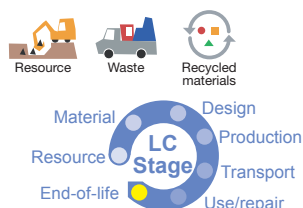
## One Dish Aid confectionery container (circulation system of returnable ceramic confectionery containers)

## Environmental performance

Ceramic confectionery containers used for puddings, etc., are usually disposable. The One Dish Aid confectionery container is made using 20% crushed (recycled) material from waste tableware collected from households, etc. This is Japan's first product for which a deposit system for container reuse was adopted. It also contributes to nature conservation and CO<sub>2</sub> reduction through a system in which 2 yen of the profits from each container are donated to tree planting activities and the like. Promotion of this product not only contributes to recycling of exhaustible ceramic materials, but also if use at least 5 times during its total lifecycle, reduces CO<sub>2</sub> emissions to 1/4 those of conventional containers.

## Product performance

To enable this product to be used repeatedly, it has an antifouling highly-glazed finish, an easy-to-wash shape, slits to facilitate drying of the base, and thick edges to improve its washing efficiency and strength. The containers come in three sizes frequently used for confectionery, and two colors (white and brown), with an extremely safe glaze. A stackable type has also been put on the market to improve storage efficiency in shops and homes.



## NPO JAPAN One Dish Aid Association

Shibuya Bldg. 5F 6-10 Samon-cho, Shinjuku-ku, Tokyo, 160-0017, Japan

Tel +81-3-3354-9012 Fax +81-3-3354-9013

E-mail [info@e-sakon.co.jp](mailto:info@e-sakon.co.jp)

URL <http://onedish.net>

URL [http://onedish.net/youki/youki\\_top.html](http://onedish.net/youki/youki_top.html)

URL <http://onedish.net/katsudou/index.html>

Available in: Japan

