Eco-materials

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

In the *Eco-products Directory 2008*, "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, and materials that are very efficient and resource-saving while still offering good performance, and much more.

Carefully assessing the impact on the environment within its life cycle from the manufacturing to the disposal stage is important in choosing eco-materials. Once this has been clarified, it can be taken into consideration to create an eco-product well balanced between function and eco-efficiency. Based on this concept, eco-materials must meet the following six distinctive factors:
(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.

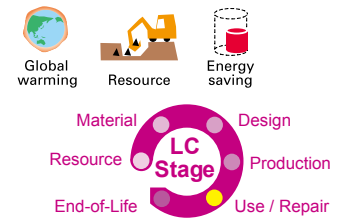
Eco-materials

EM-1-001 **Metals**

steel pipe materials

SUPER 304H, HR3C stainless steel tubes for boiler

New ultra-super critical boilers used in thermal power plants operate at higher temperatures and pressures. These systems bring better generation efficiency and thereby reduce emissions of CO_2. However, high-strength steel pipe materials that offer excellent corrosion resistance are required in these boilers. By adding copper (Cu), niobium (Nb) and nitrogen elements to existing 18% Cr, 9% Ni steel alloy material and improving manufacturing processes, Sumitomo Metals has realized a new type of high-strength, high-temperature steel pipe capable of withstanding steam and oxidation corrosion. The pipes therefore meet the rigorous operating requirements of ultra-super critical boilers. In a related development, Sumitomo Metals has also created a new steel material that meets strict requirements for corrosion resistance by raising the content of Cr in the steel to 25%.



Boiler for thermal power generation

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Available in : Worldwide

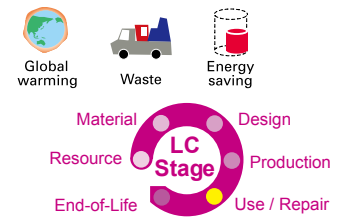
Eco-materials

EM-1-002 **Metals**

steel pipe materials

Invar alloy for LNG transportation

As LNG has an extremely low temperature, pipes expand and contract depending on whether liquid is flowing through them or not. Previously, to absorb this expansion and contraction, it was necessary to install a U-shape in the pipes. However, with joint research by Sumitomo Metals, Osaka Gas Co., Ltd., Kawasaki Heavy Industries, Ltd., and Sumitomo Metal Pipeline and Piping, Ltd., we developed new piping technology without U-shape by the application of Invar alloy (36% Ni-Fe) of which linear expansion coefficient property is extremely small. This alloy was utilized for the pipes in the world's first undersea tunnel connecting LNG terminals at Osaka Gas' Senboku facility. As U-shaped piping was not required, the tunnel was constructed with a smaller inner diameter, saving excavation costs. This development is contributing to the stable supply of LNG, a clean energy source.



Straight LNG piping set up in the undersea tunnel

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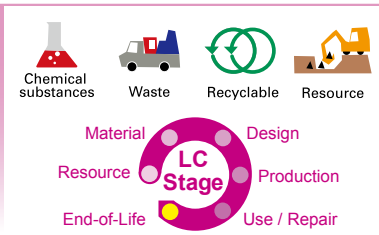
Eco-materials

EM-1-003 **Metals**

small bar steel

High-strength steel for forged connecting rods

A connecting rod is a vital part that connects a crankshaft and a piston in an engine to transmit power. Sumitomo Metals and Honda Motor Co., Ltd. have jointly developed high-strength steel for use in forged connecting rods with a 30% higher resistance to metal fatigue, while reducing weight by 13%. These components are currently used in the Honda Legend and Civic. No lead is used to make the steel, thereby helping to reduce environmental load.



Cracking connecting rod

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Available in : Worldwide

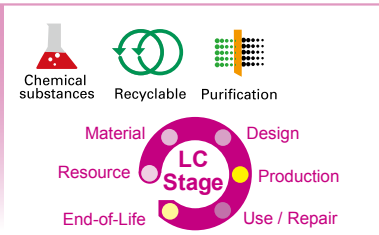
Eco-materials

EM-1-004 **Metals**

small bar steel

Lead-free free-cutting steel (steel bars)

The shapes of crankshafts used in automobiles, among others, are very complicated. Manufactures 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 rage of products to meet the needs of automakers has been developed and offered by Nippon Steel.



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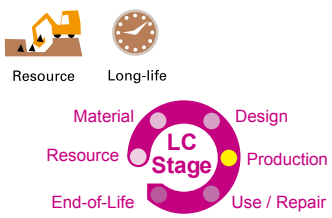
Eco-materials

EM-1-005 **Metals**

medium thick sheet steel

FCA steel

As increasing traffic volumes put more frequent stress on structures, reducing the occurrence of fatigue cracks and their propagation is a major issue in determining the lifetime of bridges. By using our fatigue crack arrester (FCA) steel with its outstanding fatigue resistance properties the fatigue lifetime can be extended by more than 100% compared with conventional steel. Furthermore, by enhancing weather resistance, maintainability is also improved.



The Irino Bridge (provisional name), currently under construction, is using FCA steel.

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Available in : Worldwide

Eco-materials

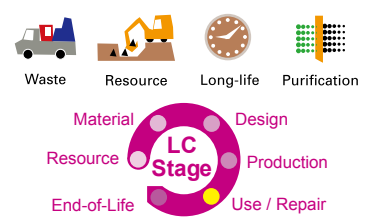
EM-1-006 **Metals**

medium thick sheet steel

The New S-TEN1, high corrosion resistance steel material

Demand for steel material with outstanding anti-corrosive properties is growing rapidly, especially from waste incinerating facilities exposed to corrosive hydrochloric 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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Eco-materials

EM-1-007 **Metals**

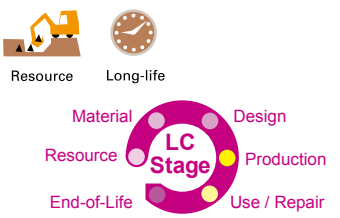
medium thick sheet steel

HTUFF(Super High HAZ(Heat-affected zone) Toughness

The steel plates for ships, buildings, bridges and other large structures are prone to coarsening when exposed to the heat required during the welding process (coarsening which namely reduces toughness). 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 of 1400 degrees Celsius and more.

The HTUFF steel sheet drastically improved the welding efficiency of users and contributed toward energy savings. The HTUFF is the recipient of the 36th Ichimura Industrial Award presented by the New Technology Development Foundation in FY2003.



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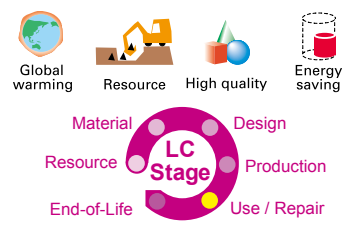
Eco-materials

EM-1-008 **Metals**

sheet steel

Electrical Steel Sheets for Hybrid Cars

Highly efficient and non-oriented electrical steel sheets, when adopted in driving motor cores, improve automotive fuel economy and contribute to downsizing/weight reduction of auto bodies. Meanwhile, highly efficient and silent electrical steel sheets containing 6.5% Si (known as "Super Core") are adopted in reactor cores for pressor systems.



Reactor core-block core type

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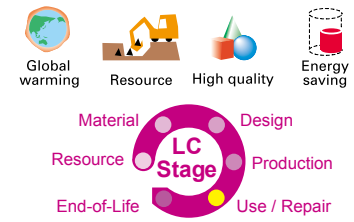
Eco-materials

EM-1-009 **Metals**

sheet steel

SXH electrical steel sheet for high-efficiency motors

Demand is growing for hybrid vehicles and efficient air conditioners, which are seen as one way of helping to preserve the environment. We have developed the SXH series of non-oriented electrical steel sheet for use in the iron core of hybrid vehicles' drive motors and air conditioners' compressing motors. This steel features superior electromagnetic characteristics and excellent workability. By controlling the orientation of the steel crystals, we have succeeded in boosting energy conversion efficiency, thereby contributing to significant reductions in CO_2. This technology won the 39th (fiscal 2007) Ichimura Industrial Prize, Contribution Award.



Driving motor for hybrid car

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Available in : Worldwide

Eco-materials

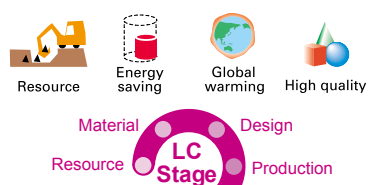
EM-1-010 **Metals**

sheet steel

Sumi Quench steel sheet for hot pressing

The hot pressing process involves heating steel to the temperatures close to 900ºC, pressing the steel at high temperatures while it is soft, and quenching the steel in the pressing die. Shaping and quenching occur simultaneously, causing the steel to achieve higher strength. This technology results in steel sheets with tensile strengths of 1000 MPa or higher, which previously were difficult to use in automotive component applications. Impact-absorbing door steel produced by this method is 30% stronger and 10% lighter than conventional steel. Furthermore, its dimensional accuracy is on a par with ordinary pressed steel. This technology is being applied to the production of automotive structural parts.

MPa (Megapascal): a unit of pressure or stress. Mega means one million.



Door beam

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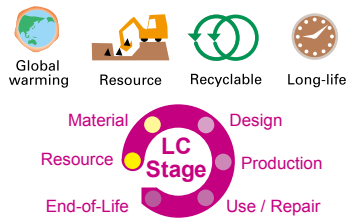
Eco-materials

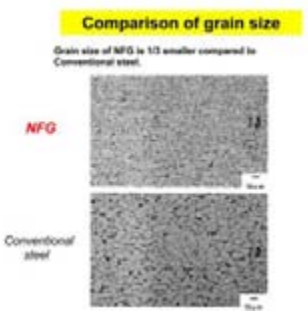
EM-1-011 **Metals**

sheet steel

NFG,Ultrafine grained steel sheets

Reducing the grain size of steel increases the strength.Ultrafine grained steel has a fine grain of 1-5microns.The steel has less rare earth alloy,and is expected to have the characteristics of low temperature toughness,high fatigue strength and good workability. This material is expected to contribute greatly to realization of the social demands such as enegy saving,resouce saving and environment conservation.We developed facilities and constructed an actual hot strip mill introducing new concepts.We succeeded in producing ultrafine grained steel sheets of 2-5microns industrially.





Nakayama Steel Works,Ltd.

1-1-66, Funamachi, Taisho-ku, Osaka 551-8551, Japan
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URL http://www.nakayama-steel.co.jp

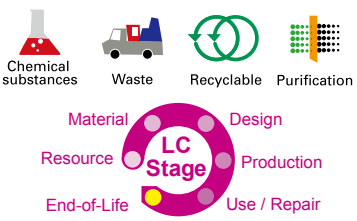
Eco-materials

EM-1-012 **Metals**

cold rolled steel sheets

Sumitomo Hi-Coat NEO (high corrosion-resistance type)

Sumitomo Metals was one of the first in the industry to begin developing environmentally friendly pre-coated steel sheet with the high corrosion resistance required for outdoor electronic equipment and other items. Despite containing no chrome, our pre-coated steel sheet keeps the same corrosion resistance as products containing hexavalent chromium that is the first in Japan. This product's environmental responsiveness and performance in outdoor applications were recognized by Mitsubishi Electric Corporation, which has been using the product in external air conditioner units since 2005.



External air conditioner unit

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Available in : Worldwide

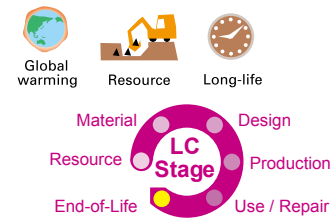
Eco-materials

EM-1-013 **Metals**

sheet steel

The GA-TRIP hot-dip galvanized sheet boasts the high tensile strength

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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Eco-materials

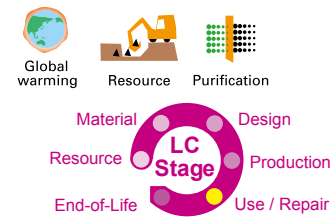
EM-1-014 **Metals**

sheet steel

High-endothermic steel sheet

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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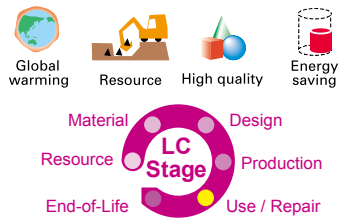
Eco-materials

EM-1-015 **Metals**

sheet steel

Flat rolled magnetic steel sheet/strip for high electrical efficiency

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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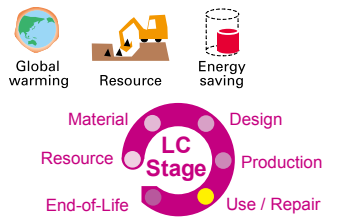
Eco-materials

EM-1-016 **Metals**

sheet steel

High tensile strength steel sheets (HITEN)

High tensile strength steel sheets (HITEN) are used in various parts of automobiles and extremely effective for automotive weight reduction. SFG HITEN was the first steel sheet used in auto side panels, while 980 MPa HITEN sheets are used in the center pillar and various reinforcing members, achieving a 5-10% weight reduction in an entire auto body.



JFE Steel Corporation

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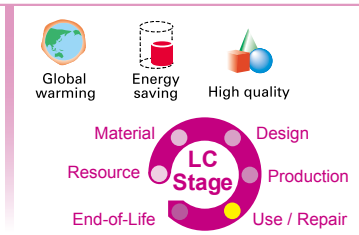
Eco-materials

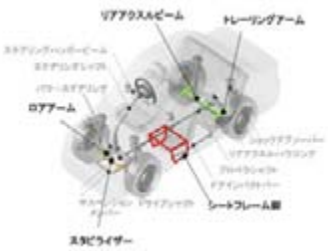
EM-1-017 **Metals**

hot drawn common steel pipes

Automotive Steel Tubes

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.





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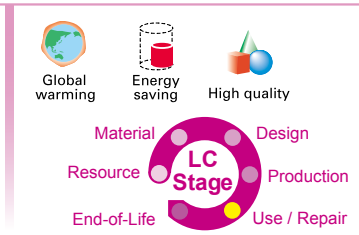
Eco-materials

EM-1-018 **Metals**

cold-rolled special steel sheets

An exhaust manifold material, JFE-WX1

An exhaust manifold material, JFE-WX1 is the only ferritic stainless steel in the world, which can be used at ultra-high temperature. It improves auto fuel economy, reduces CO_2 emissions, and contributes to exhaust gas purification.



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Eco-materials

EM-1-019 **Metals**

cold-rolled special steel sheets

JFE443CT

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.

JFE Steel Corporation

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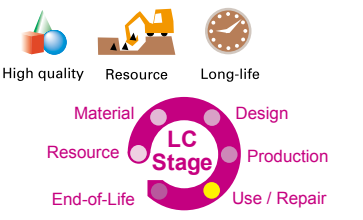
Eco-materials

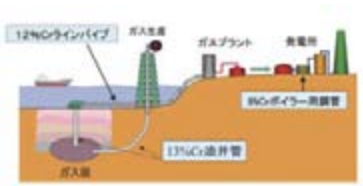
EM-1-020 **Metals**

hot-drawn special pipes

Martensitic Stainless Steel Tubes/Threaded Joints

13% Cr oil well tube and 12% Cr line pipe for production and transport of oil and natural gas, and 9% Cr steel pipe for high-efficient power generation are materials having long life and low environmental loads. As for threaded joints used in combination with oil well tubes, new products using no environmental pollutants are provided.





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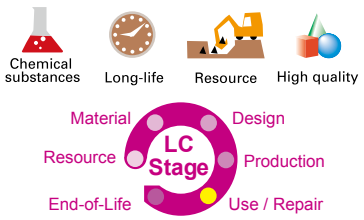
Eco-materials

EM-1-021 **Metals**

steel materials

High Performance Weathering Steel

This steel product suppresses the corrosion of steel products and eliminates painting process in the air by forming dense rust in the air. It reduces environmental loads due to painting.



High Performance Weathering Steel

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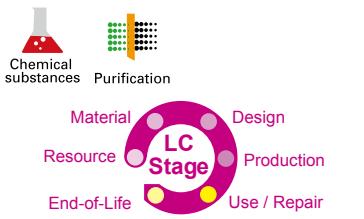
Eco-materials

EM-1-022 **Metals**

coated steel

Lead-free steel sheet for car fuel tank

Conventially, lead-coasted 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.



Nippon Steel Corporation

2-6-3, Otemachi, Chiyoda-ku, Tokyo , Japan
Tel 81-3-3275-5144 Fax 81-3-3275-5979
E-mail kankyo@nsc.co.jp
URL http://www0.nsc.co.jp/kankyou/index.html

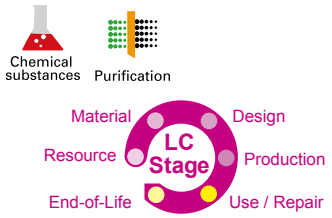
Eco-materials

EM-1-023 **Metals**

coated steel

Steel sheet coated with chromate-free film

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 s 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.



Nippon Steel Corporation

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E-mail kankyo@nsc.co.jp
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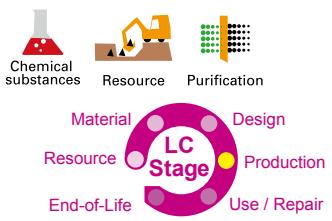
Eco-materials

EM-1-024 **Metals**

coated steel

Pre-coated steel sheet; to eliminate the painting

Nippon Steel's prepainted steel sheet (trademarked as Viewcoat) is used in washing machines, refrigerators and outdoor air conditioner units. Customers can specify their chosen color and this eliminates the painting process following fabrication and assembly. Pre-painted on a dedicated painting line, Viewcoat excels in paint film quality, minimizes paint loss and greatly reduces environmental impact.



Nippon Steel Corporation

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E-mail kankyo@nsc.co.jp
URL http://www0.nsc.co.jp/kankyou/index.html

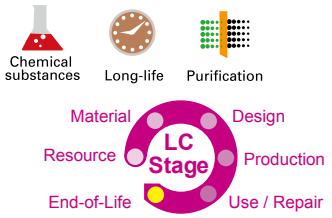
Eco-materials

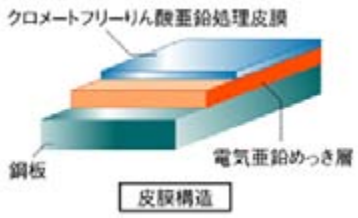
EM-1-025 **Metals**

galvanized steel sheets

Chromate-free Coated Steel Sheet

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.





JFE Steel Corporation

2-3, Uchisaiwai-cho 2-chome, Chiyoda-ku, Tokyo 100-0011, Japan
Tel Fax
E-mail
URL http://www.jfe-steel.co.jp

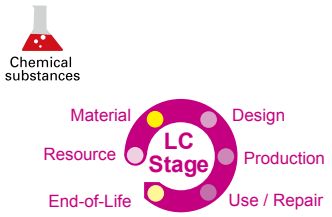
Eco-materials

EM-1-026 **Metals**

galvanized steel sheets

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

As an environment-friendly product, "JAZ" does not contain phosphate or heavy metal elements which used to be contained in conventional highlylubricanted 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 plates or inner plates which are otherwise difficult to be formed. More specifically, it is used in side panels, fenders, doors, and wheelhouses, etc.



1,200 t actual press test(Fender model)

JFE Steel Corporation

2-3, Uchisaiwai-cho 2-chome, Chiyoda-ku, Tokyo 100-0011, Japan
Tel Fax
E-mail
URL http://www.jfe-steel.co.jp

Eco-materials

EM-1-027 **Metals**

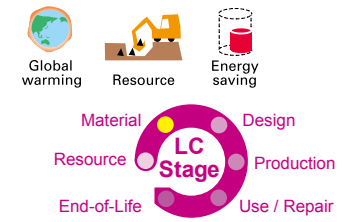
non-ferrous metals by primary smelting and refining

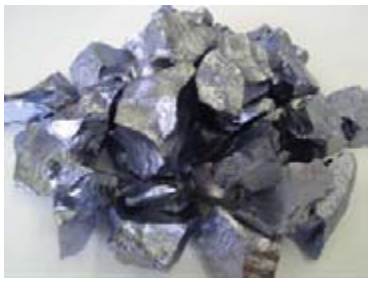
Polycrystalline Silicon (Materials for solar power systems)

We are producing polycrystalline silicon for semiconductor and solar cell from metallurgical silicon by processing it through chlorination, distillation and reduction processes.

The polycrystalline silicon for solar cell is a major raw material for photovoltaic industry and the energy generated from solar cell is clean without any generation of CO_2.

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.





Polycrystalline silicon for solar cell

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
URL http://www.mmc.co.jp

Available in : Japan, USA, Europe and Southeast Asia

Eco-materials

EM-1-028 **Metals**

rolled and drawn brass products

ECO BRASS (High performance Lead-free Copper Alloy)

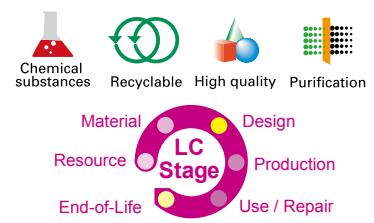
ECO BRASS is a lead-free brass and environmentally friendly brass material. Instead of using heavy metal harmful to the human body, a precipitating metallic compound in the metal structure realizes good machinability.

Key Features:

1) Lead-free environmentally friendly brass material
2) High strength equivalent to stainless steel
3) Good machinability nearly equal to brass rod containing 1% lead
4) Excellent machined surface
5) Excellent de-zincification corrosion resistance
6) Excellent stress corrosion cracking resistance
7) Excellent warm brittleness cracking resistance
8) Excellent hot forgeability
9) Easily accepts soldering and brazing
10) 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, screw, bearings
3) Electrical parts and connectors
4) Automobile parts: lead-free requirements
5) Medical devices



Machined Products using ECO BRASS rods

Mitsubishi Shindoh Co., LTD **(the former Sambo Copper Alloy 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
E-mail tech@sambo.co.jp
URL http://www.sambo.co.jp

Available in : Except North America & Europe

Eco-materials

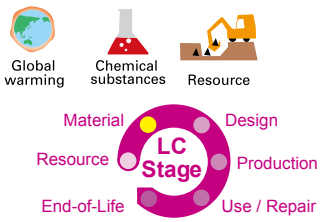
EM-1-029 **Metals**

food cans

Universal Bright F

This award-winning steel sheet product enables can manufacturers to skip coating and printing processes, and thereby eliminates harmful substances and reduces CO_2 emissions.

(Awarded the Technology Prize by the Surface Finishing Society of Japan in 2005)



Example of canmaking (half-pound food can)

JFE Steel Corporation

2-3, Uchisaiwai-cho 2-chome, Chiyoda-ku, Tokyo 100-0011, Japan
Tel Fax
E-mail
URL http://www.jfe-steel.co.jp

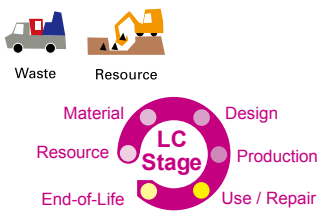
Eco-materials

EM-1-030 **Metals**

carbon black

Tow Sheet, Maintenance and reinforcement material for concrete structures

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

2-6-3, Otemachi, Chiyoda-ku, Tokyo , Japan
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E-mail kankyo@nsc.co.jp
URL http://www0.nec.co.jp/kankyou/index.html

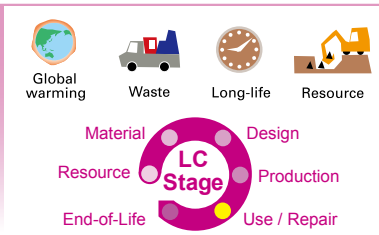
Eco-materials

EM-1-031 **Metals**

residential buildings

Construction method using thin-sheet steel

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-for 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

2-6-3, Otemachi, Chiyoda-ku, Tokyo , Japan
Tel 81-3-3275-5144 Fax 81-3-3275-5979
E-mail kankyo@nsc.co.jp
URL http://www0.nsc.co.jp/kankyou/index.html

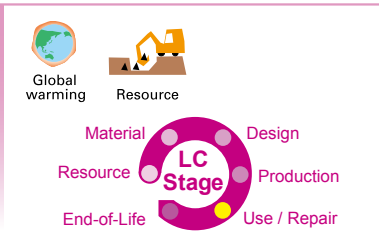
Eco-materials

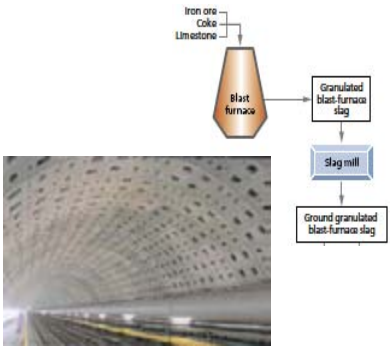
EM-1-032 **Others**

Granulated Blast-Furnace Slag

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

The Granulated Blast-Furnace Slag ("GBFS") is produced by the rapid granulation of molten slag that is obtained during the iron making process. GBFS is primarily consisted of CaO and SiO_2 together with minor chemical component such as Al_2O_3, MgO and others. 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. Recent concerns for global warming highlighted the value of GBFS and GGBFS. GBFS and GGBFS contributes to reduce CO_2 emission amount equal to approximately 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 supplies GBFS or GGBFS from 5 steel works that are distributed along side of Japan to domestic as well as overseas customers.





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

Nippon Steel Corporation

2-6-3, Otemachi, Chiyoda-ku, Tokyo,
Tel 81-3-3275-5144 Fax 81-3-3275-5979
E-mail kankyo@nsc.co.jp
URL http://www0.nsc.co.jp/kankyou/index.html

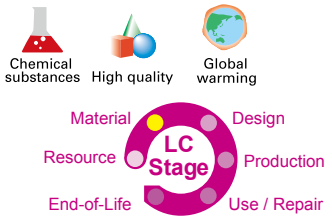
Eco-materials

EM-2-001 **Polymers**

epoxy resin molding materials

SUMIKON® EME epoxy molding compound for semicond

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 abouttheir 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 SUMIKONR EME G700 series for applications that require high reliability and the new SUMIKONR EME G600 series for ordinary semiconductor package applications, all of which use an epoxy resin with superior fire retardant capabilities.We also launched the SUMIKONR EME E series for discrete applications. Centered on material design technology that reduces environmental impact, this "green" family of products can be used for applications ranging from cutting-edge packages to ordinary packages and is enabling the Company to reduce its environmental impact.



Sumitomo Bakelite Co., Ltd.

Tennosu Parkside Bldg., 2-5-8, Higashishinagawa, Shinagawa-ku, Tokyo 140-0002, Japan
Tel 81-3-5462-3472 Fax
E-mail
URL http://www.sumibe.co.jp/index.html

Eco-materials

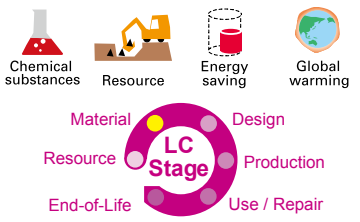
EM-2-002 **Polymers**

coating materials

SUMIRESIN EXCEL® CRC wafer coating material

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 EXCELR CRC 8000 series of positive photosensitive wafer coating resins. This enables semiconductor manufacturers to use alkaline water as 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
Tel 81-3-5462-3472 Fax 81-3-5462-4873
E-mail
URL http://www.sumibe.co.jp/index.html

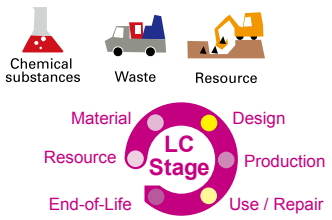
Eco-materials

EM-2-003 **Polymers**

laminates material system for rigid/flex printed circuit board

Laminates material system for Rigid/Flex Printed Circuit Board "CUTE"

This laminates material system offers a material developed by using novel low elastic modulus resin system and ultra thin glass fabric and a film material with excellent dimensional stability achieved with hard segments in the resin system. As ultra thin and bendable materials, they can contribute to reducing the size and improving the performance of mobile device and medical equipment.



Hitachi Chemical Co.,Ltd.

1500 Ogawa Chikusei-shi, Ibaraki 308-8521, Japan
Tel 0296-20-2217 Fax 0296-28-6128
E-mail
URL http://www.hitachi-chem.co.jp

TC-C-300/TC-F-300

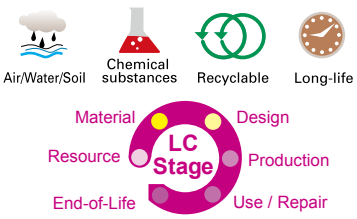
Eco-materials

EM-2-004 **Polymers**

heavy metal free stabilisers

Calcium Zinc one pack stabilisers

Calcium Zinc one pack stabilisers are free from heavy metal ingredients to offer efficient stabilisation and processability during the manufacturing of PVC products. The one pack stabiliser complies with RoHS requirements for electrical application. This ensures ease of recycling of the finished product whilst minimising impact on the environment during use and life cycle of the product. This is possible with suitable selection of other additives needed in the total formulation of the PVC compound used in conversion to the finished product form.



Calcium Zinc One Pack Stabiliser for Cable

Sun Ace Kakoh (Pte.) Ltd

34 Tanjong Penjuru, Jurong Town 609030, Singapore
Tel (65) 6264 0255 Fax (65) 6265 7038
E-mail sales@sunace.com.sg
URL http://www.sunace.com.sg

Available in : Singapore

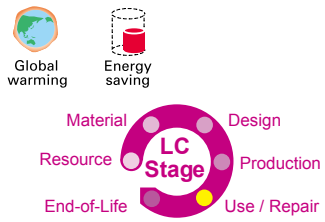
EM-2-005 **Polymers**

polymers, plastics, plastic products

S-Lec Solar Control Film / S-Lec Sound & Solar Film

This product(SCF) is used by being sandwiched with 2 sheets of glass pane to become laminated glass. Laminated glass has nice performances like penetration resistance performance, UV ray cut-off performance and so on. Thanks to these excellent performances, laminated glass has been used on both automotive application(windscreen, sidelite, backlite and rooflite) and building application(window and partition) for safety, security and comfort purpose in the world. Infrared ray cut-off fine particles are finely dispersed in this product. Thanks to this IR cut-off fine particle, laminated glass with SCF can effectively prevent undesirable heat ray(IR ray) from entering inside.

In case of automotive application for instance, steering temperature inside the vehicle cabin with SCF windscreen is around 10degree Celsius lower than that with normal windscreen during summer time parking. This temperature reduction can contribute to lowering air conditioning load and improving fuel consumption efficiency. Brother product of SCF is S-LecR Sound & Solar Film(SSF). Addition to the heat energy cut-off performance of SCF, noise reduction performance can be enjoyed with SSF laminated glass.



Sekisui Chemical Co., Ltd.

2-3-17, Toranomon, Minato-ku, Tokyo , Japan
Tel Fax
E-mail kankyo@sekisui.jp
URL http://www.sekisui.co.jp/

Eco-materials

EM-2-006 **Polymers**

polylactic acid fiber, resin & materials

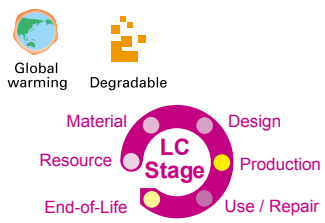
Polylactic acid Fiber, resin & Materials

Polylactic acid is a recyclable biomass substance made from plants developed to replace the earth's limited petroleum resources. It is produced by the polymerization of lactic acid generated from the fermentation of starch.

1.Fiber
Toray has succeeded in the fiberization of this polymer. "Ecodear"fiber & textile have characteristics similar to petroleum-based synthetic fibers.

2.Resin
Toray succeeded to improve polylactic acid resin by our original polymer alloy (nano-alloy) technology.
Compared to the existing PLA resin, heat resistance, impact strength and moldability are greatly improved.
Toray developed halogen-free flame retardant (UL-V0) PLA compound for injection molding.

3.Film and sheet
Toray succeeded to develop new PLA film, which has more flexibility and heat stability compared to the existing PLA film.
Our new PLA film can be used for various types of packages, containers, or any other film applications.



Polylactic acid Fiber, resin & Materials

Toray Industries,Inc.

2-2-1, Nihonbashi-Muromachi, Chuou-ku, Tokyo 103-8666, Japan
Tel 81-3-3245-5115 Fax 81-3-3245-5344
E-mail Product@nts.toray.co.jp
URL http://www.toray.jp

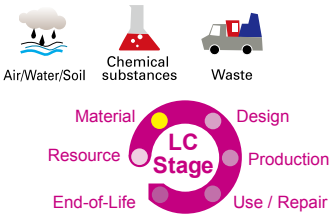
EM-2-007 **Polymers**

Waterless Plate

Toray Waterless Plate

Conventional offset printing process uses Water to repel ink from non-image areas. This water usually contains Alcohol, which is classified as Volatile Organic Compound (VOC) and hazardous to the environment. Toray Waterless Plate, with silicone layer on surface, does not require Water on the printing process. Along with its unique plate-making system, Toray Waterless Plate can dramatically reduce hazardous wastage from whole printing production and contribute to environmental conservation. Silicone layer has a same role (repels ink) as Water Reduces enormous water exhaust that contains. Alcohol Develop with Water - No wastage of strong alkaline solution

"The Butterfly Logo", a symbol of Waterless Printing, can be shown on many printed material in recent years, which shows print buyers' concern for environmental protection. It projects customer's environmental policy and helps printer increase customer base.



Water Printinng Asociation Butterfly mark

Toray Industries,Inc.

2-2-1, Nihonbashi-Muromachi, Chuou-ku, Tokyo 103-8666, Japan
Tel 81-3-3245-5115 Fax 81-3-3245-5344
E-mail Product@nts.toray.co.jp
URL http://www.toray.jp/products/ele/ele_016.html

Available in : Japan

Eco-materials

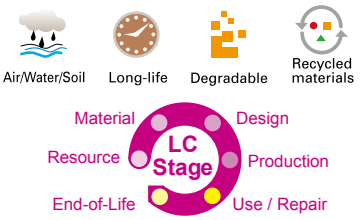
EM-3-001 **Natural materials**

organic fertilizers

MIGHTY HUSK, environment-friendly botanical soil-material

The product made from the husk (mesocarp) of coconut. Husk is cut down to pieces, soaked in water to remove the tannins and then dried by the sunlight, sterilized with high-temperature steam, and finally compressed to encase. The properties and possible uses are as follow.

1. The husk is composed mainly of porous, light weight structure woody fiber, (50~100g/l).It is excellent in keeping warm, air permeability, and water-holding capacity (max1320%). The period of water holding is longer than those of peat moss and sphagnum moss.
2. It works as soil reforming agent. Since it does not rot easily, it keeps the effects of improving the oil and activating the microorganism for a long period.
3. It contains a little amount of Fe,Zi,Si,and Cu,and 1.23~1.43% of K,which are indispensable to promote the growth of plants specially potash which helps to develop good roots.
4. It has a large absorption coefficient value for ammonia (440~510mg/dry husk 100g) and that for phosphoric acid (401~410mg/dry husk 100g), so it works as deodorant and also together with strong water absorb nature, it is most suitable as the floor material of a horse stable or a henhouse to absorb smell and manure.



Husk Chip Bag, SIZE 30cmX30cmX60cm

Taiheibussan Co., Ltd.

Mitsuiseimeisinohashi BLDG 4F, 1-8-11 Shinohashi, Koutou-ku, Tokyo 135-0007, Japan
Tel 81-3-6662-5850 Fax 81-3-5669-1152
E-mail msuzuki@taiheibussan.co.jp
URL

Eco-materials

EM-3-002 **Natural materials**

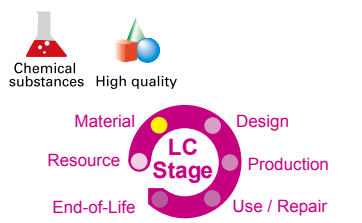
pure worsted yarn

ECO-WASH:Eco-friendly shirink-resistant wool

Conventional chlorination treatment applied for shrink-proofing of wool fiber causes an environmental contamination. Beause, the residual chlorine in the industrial waste water drained into rivers reacts with organic matters and turns into carcinogen (AOX=Absorbable Halogens), a harmful substance to humans and the environment.

While in Kurabo's ECO-WASH treatment, 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. Thus, ECO-WASH is the world first shrink-resistant wool by Ozone treatment.

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



Water Repellent Test of Various treated wool

KURABO INDUSTRIES LTD.

4-31, 2-Chome, Kyutaro-Machi, Chuo-Ku, Osaka 541-8581, Japan
Tel 81-6-6266-5084 Fax 81-6-6266-5369
E-mail Takashi_Kanda@kurabo.co.jp
URL http://www.kurabo.co.jp

Eco-materials

EM-3-003 **Natural materials**

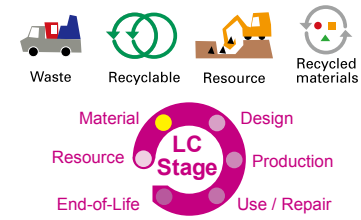
cotton fabrics

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

Fabric made from blending of excellent flameproof acrylic fiber and unused cotton generated during spinning process accounting for 10% of total material.

- 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^2)
- Refreshing and easy-to wear, due to their excellent sweat absorption.
- Would not pill.
- Good coloring, good color fastness.
- Designated "EcoMark certified product", Japan's enviromental label.

* 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.



combustion test

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/

Eco-materials

EM-3-004 **Natural materials**

cotton fabrics

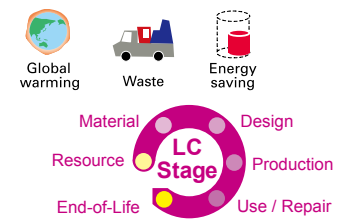
BioNature:Eco-oriented soil-returnable fabric

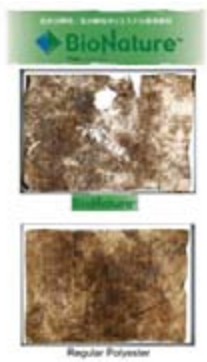
A brand-new polyester and cotton mixed fabric using hydrolyzable, biodegradable polyester of DUPONT's "Biomax".

When BioNature is left for long time in a water-rich environment with appropriate temperature and lots of microorganism, it eventually turns into water and carbon dioxide, as the result of biodegradation, after passing through the process of hydrolysis. As the process of biodegradation is very slow,it will not adversely affect the animal or plant.

The amount of carbon dioxide emitted from burning this fabric is less, compared to the emitted amount when burning general fabrics, and combustion calorie is also low. It is also proved that the ash does not contain any harmful substance.

The fabric will hardly deteriorate in ordinary use.





fabrics buried in the ground for ten months

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/

Eco-materials

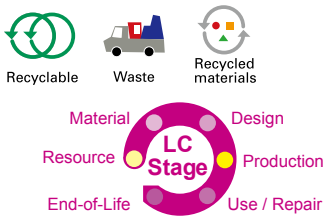
EM-3-005 — **Natural materials**

fabrics

GREENPET:PET bottle-recycled polyester and various plant fibers combined fabric

Fabric made from combination of natural fibers carded with Kurabo's unique technologies, GETTOU(a kind of ginger), bamboo, kenaf, hemp, and PET bottle-recycled polyester.

Products designated "EcoMark certified product", Japan's environmental label.



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/

GREENPET

logo

Eco-materials

EM-3-006 — **Natural materials**

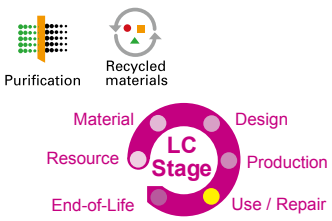
air purifiers

Mist-emission Equipment featuring Nano-Hiba oil aiming for Air Purification

Aomori Prefecture has beautiful forests of the broad-leaved arborvitae (called "Aomori Hiba") that are famous for being one of the "Three Great Beautiful Forests in Japan" as well as "Hinoki cypress" forests in Kiso district in Nagano Prefecture and "Japanese cedar" forests in Akita Prefecture.

The Tsugaru and Shimokita Peninsulas are home to the "Aomori Hiba", accounting more than 82 percent of Hiba forests across Japan.

"Aomori Hiba" are mostly used for building houses after sawing at lumber mills which produce sawdust 20 to 30 % of the total Hiba materials processed. Research has been underway to find some useful application of the sawdust. "Aomori Hiba oil" is one of the outcomes. There is growing evidence that "Aomori Hiba oil" includes number of active substances as well as "Hinokitiol". Now "Aomori Hiba oil" attracts public attention and offers useful applications because of its safety but excellent germ and insect resistant effect. "Mist-emission equipment", one of our products, has been developed by taking an advantage of "Aomori Hiba oil" to provide access for achieving comfortable, allergy-free room environment or debugging at a greenhouse



ANDES Electric Co., Ltd.

1-3-1, Kikyono Kogyodanchi, Hachinohe City, Aomori 039-2292, Japan
039-2292, Japan
Tel Fax
E-mail
URL

Available in : Japan

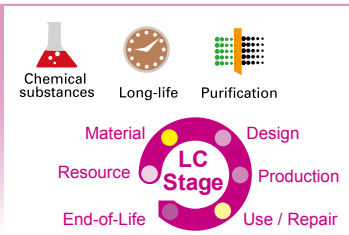
Eco-materials

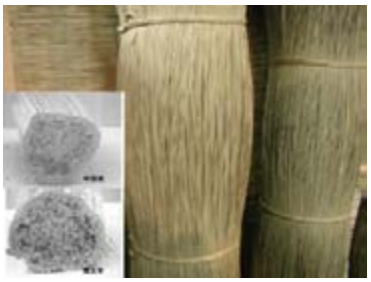
EM-3-007 **Natural materials**

tatami mattings

" 環良草 ®" : stronger skin rush

Rush is a kind of plant that has been used in Japanese housing from the old days, and it is widely known as a material of “Tatami”. The features of “Tatami” are not only the fragrance and strength, but also the humidity control. In addition, it has been lately found that the rush has a function of adsorbing chemical substances and that of deodorizing. The “ **環 良 草** ®” rush has stronger skin compared to the previous rush, (ref., the photograph of electron-microscopy). This is a result due to the cultivation in which the intrinsic activity of rush was fully taken out. Every piece of the rush is thick and uniform. The life of the product made from “ **環良草** ®” is therefore long. Rush is a plant and glows by taking CO_2 in its body. Namely, the long-life “ **環 良 草** ®” product fixes CO_2 for a longer period than conventional products. We are therefore contributing to the fixation of CO_2 by raising the young plant of rush, every year.





KANRYOUSOU®

IKEHIKO CORPORATION Co.,Ltd.

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

Available in : Japan

Eco-materials

EM-3-008 **Natural materials**

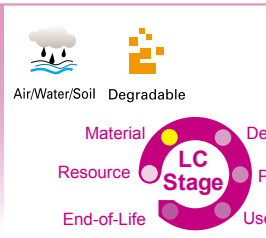
ecm-erosion control materials

ABACUScoir Natural Fibers Erosion Control Matting

ABACUScoir is used for protection of exposed soils surface from rainfall, snow, floods. Soils protected do not flow into the waterways which would clogged and cause damage to the environment.

ABACUScoir comes in weight of 400, 700 and 900 gm/m^2 and can be shipped in any part of the world. It is a natural, biodegradable and strongly recommended to replace synthetics matting, especially when used for surface soil protection.

ABACUScoir is one way for engineers and environment officers to employ to obtain clean and skyblue waterways.



Abacus Corporation Pte Ltd

Blk 1 Defu Lane 10, #03-571 530182, Singapore
Tel (65) 62856100 Fax (65) 62817761
E-mail abacusmkt@gmail.com
URL http://www.abacuscorp.com.sg

Available in : ASEAN, Asia, Worldwide

Eco-materials

EM-3-009 **Natural materials**

food containers

Recyclable, Reusable Microwaveable Food Container

Paper Food Container, made from Food grade board, from sustainable reforestation plantations, recycling the land to grow trees.
Preventing and reduction from cutting virgin Forest. 100% waterproof, oil proof, washable, reusable and recyclable.

Reusable: Do not have to be thrown away after only one time use. As a FREEZER box, Microwave reheating box. Or office stationery box etc.

A multiple design awards- SingaporeStar Design award - ecstatic appearance. AsiaStar Japan Award for Point of Sales efficiency. WorldStar USA Award: design convenience and safety- including Interlocking Safety, High Speed Microwave Cooking technology, keep warm Bento box.
Prevents contamination. Compression strength more then 35kg 'not break'.

Used by the Singapore Military since 2004.

Microwave Packaging (S) Pte Ltd

196 Pandan Loop, #07-24 Pantech Industrial Complex 128384, Singapore
Tel (65) 67790891 Fax (65) 6775 2719
E-mail leonard@microwave-packaging.com
URL www.microwave-packaging.com

Available in : Singapore

SAF 160.114.58

Eco-materials

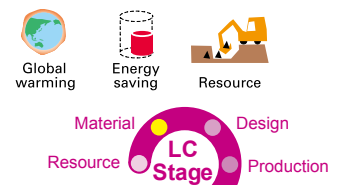
EM-3-010 **Natural materials**

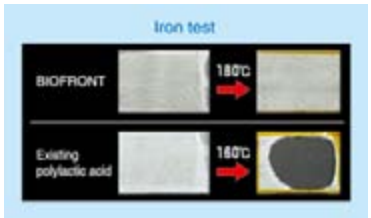
biopolymer

BIOFRONT®, heat resistant polylactic acid

Teijin Biofront® (SteroComplex PLA) is only the biopolymer to satisfy the requirement of the high heat resistance in each high end application such as automobile, office automation etc. which the current PLA can't be applied because of the limited heat resistance. Envisioned applications are as follows;

Fibers: In-vehicle products, interior products and materials requiring heat-resistant, dye-affinity and anti-bacterial properties
Films: Optical applications requiring transparency and heat resistance
Plastic resins: Electric/Electronic parts and chassis requiring heat resistance and molding.





Teijin Limited

2-1, Kasumigaseki 3-chome, Chiyoda-ku, Tokyo 100-8585, Japan
Tel 81-3-3506-4533 Fax
E-mail a.kumatori@teijin.co.jp
URL http://www.teijin.co.jp/english/index.html

Eco-materials

EM-4-001 **Foam**

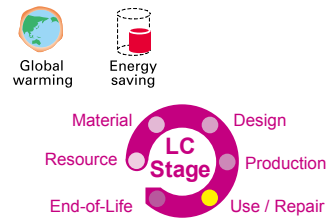
urethane insulations

Non-fluorocarbon Urethane insulation

Bridgestone switched a foaming agent of the spraying urethane insulation for the building from fluorocarbon to carbon dioxide, and achieved "no fluorocarbon".

And as a resulf of LCA (Life Cycle Assessment) about a fluorocarbon insulation and a non-fluorocarbon one, a non-fluorocarbon one has less influense on Global Warming , if the fluorocarbon that remains in the insulation is recovered and resolved at the demolition in 50 years.

Bridgestone won "The 8th ozonosphere protection and global warming prevention grand prize, Minister of the Environment prize" by this technology and the LCA in 2005.



Non-fluorocarbon Urethane insulation

Bridgestone Corporation

10-1, Kyobashi 1-chome, Chuo-ku, Tokyo 104-8340, Japan
Tel 81-3-5202-6861 Fax 81-3-5202-6866
E-mail
URL http://www.bridgestone.co.jp/english/index.html

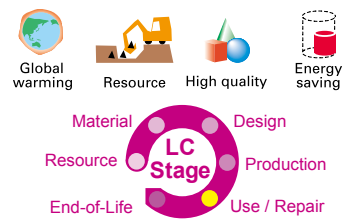
Eco-materials

EM-4-002 **Foam**

polymers, plastics, plastic products

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

The use of combustible hydrocarbon gas as a blowing agent and flame resistent property of the product are both accomplished by its unique forming technology. It contributes to the prevention of the ozone layer and 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



NEOMA® FOAM

ASAHI KASEI CONSTRUCTION MATERIALS CORPORATION

2-12-7, Higashi-Shinbashi, Minato-ku, Tokyo 105-0021, Japan
Tel 81-3-5473-5321 Fax 81-3-5473-5285
E-mail
URL http://www.asahikasei-kenzai.com

Eco-materials

EM-5-001 **Ceramics and Glass**

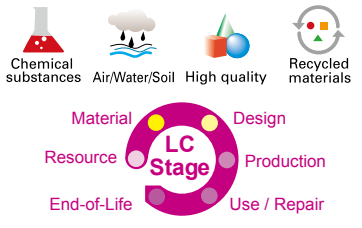
optical glass materials

Optical glass (Eco-glass) without harmful lead & arsenic

There are more than 100 types of optical glass and, in the past, NIKON used huge amounts of lead as a primary ingredient for about half of these optical glasses, while a small amount of arsenic was used in most types. These two elements have highest risk of damaging to the environment among all of ingredients used for optical glass.

However, we have now developed almost full types of optical glass, being refered to Eco-glass, without using these two elements.

We have secured optical performance solely with Eco-glass for most optical apparatus through appropriate optical design.



Lenses and prisms made with Eco-glass

NIKON CORPORATION

Fuji Bldg., 2-3, Marunouchi 3-chome, Chiyoda-ku, Tokyo 100-8331, Japan
Tel 81-3-3214-5311 Fax
E-mail
URL https://www.nikon.co.jp

Available in : World wide

Eco-materials

EM-5-002 **Ceramics and Glass**

building bricks

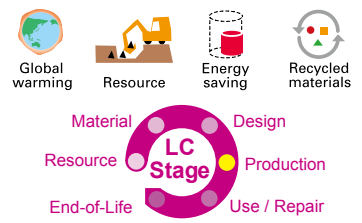
Crystal Clay CLB-series : ceramic quality blocks

< Environment-friendly >

- The product is resource-saving goods, in which the amount of clay was suppressed by the use of 70% of the waste glass.
- By using the waste glass as the raw material, the baking at a low temperature is realized, and thereby, the CO_2 discharge can be reduced in the manufacturing process.

< Performance >

- On account of its high strength, the blocks are usable at the car-passing zone.
- Because of the property of burned products, the discoloration is small for a long period, and the changes in other properties are also small.
- A large sliding friction makes it hard to slip down.



Crystalclay CLB Series

CRYSTAL CLAY CORP.

4-11-4, Roppongi, Minato-ku, Tokyo , Japan
Tel 81-3-5775-0021 Fax 81-3-5775-0024
E-mail sokato@crystalclay.co.jp
URL http://www.crystalclay.co.jp/

Eco-materials

EM-5-003 — **Ceramics and Glass**

building bricks

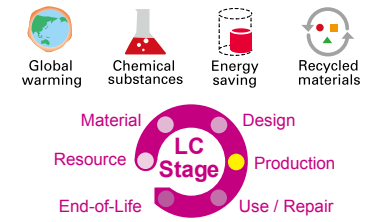
Crystal Cray CT2-series: water- permeable / -reten

< Environment-friendly >

- The product is resource-saving goods that suppressed the amount of clay by using the mixture of the glass waste (30%) and the ceramic waste (65%).
- By using the waste glass as the raw material, the baking at a low temperature is realized, and thereby, the CO_2 discharge can be reduced in the manufacturing process.

< Performance >

- The product is excellent in the following properties: water-permeability, water-retention, lowering of the surface temperature of the road, sound absorption, and heat insulation.
- On account of its high strength, the blocks are usable at the car-passing zone.
- Because of the property of burned products, the discoloration is small for a long period, and the changes in other properties are also small.
- A large sliding friction makes it hard to slip down.



Crystalclay CT2 Series

CRYSTAL CLAY CORP.

4-11-4, Roppongi, Minato-ku, Tokyo , Japan
Tel 81-3-5775-0021 Fax 81-3-5775-0024
E-mail sokato@crystalclay.co.jp
URL http://www.crystalclay.co.jp/

Eco-materials

EM-5-004 — **Ceramics and Glass**

tiles

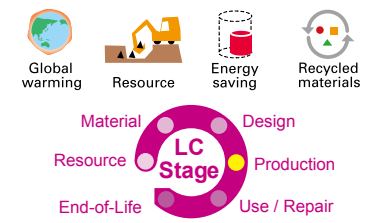
Crystal Clay FT-series: stoneware quality tiles

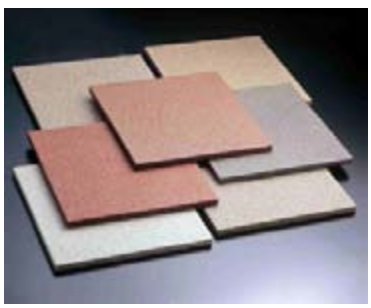
< Environment-friendly >

- The product is resource-saving goods, in which the amount of clay was suppressed by the use of 60% of the waste glass.
- By using the waste glass as the raw material, the baking at a low temperature is realized, and thereby, the CO_2 discharge can be reduced by 32% in the manufacturing process.

< Performance >

- The goods are excellent in the durability.
- A large sliding friction makes it hard to slip down.
- Because of the property of burned products, the discoloration is small for a long period, and the changes in other properties are also small.





Crystalclay FT Series

CRYSTAL CLAY CORP.

4-11-4, Roppongi, Minato-ku, Tokyo , Japan
Tel 81-3-5775-0021 Fax 81-3-5775-0024
E-mail sokato@crystalclay.co.jp
URL http://www.crystalclay.co.jp/

Eco-materials

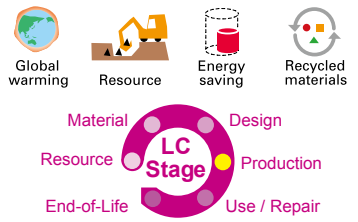
EM-5-005 **Ceramics and Glass**

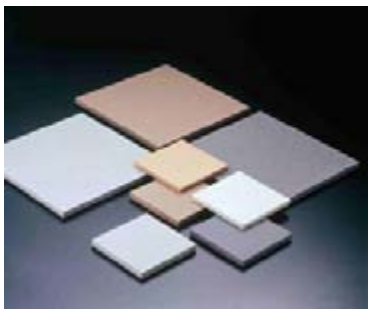
tiles

Crystal Clay FP-series : porcelain quality tiles

< Environment-friendly >
- The product is resource-saving goods, in which the amount of clay was suppressed by the use of 60% of the waste glass.
- By using the waste glass as the raw material, the baking at a low temperature is realized, and thereby, the CO_2 discharge can be reduced in the manufacturing process.

< Performance >
- The goods are excellent in the durability.
- A large sliding friction makes it hard to slip down.
- Because of the property of burned products, the discoloration is small for a long period, and the changes in other properties are also small.





Crystalclay FP Series

CRYSTAL CLAY CORP.

4-11-4, Roppongi, Minato-ku, Tokyo , Japan
Tel 81-3-5775-0021 Fax 81-3-5775-0024
E-mail sokato@crystalclay.co.jp
URL http://www.crystalclay.co.jp/

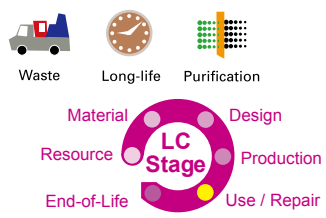
Eco-materials

EM-5-006 **Ceramics and Glass**

paving materials

Road Cool

This pavement material contains ground granulated BF slag to reduce urban heat island effects. Road Cool excellently retains rainwater and ensures watersprinkling effects.atersprinkling effects.



JFE Steel Corporation

2-2-3 Uchisaiwaicho, Chiyoda-ku, Tokyo 100-0011, Japan
Tel Fax
E-mail
URL http://www.jfe-steel.co.jp/

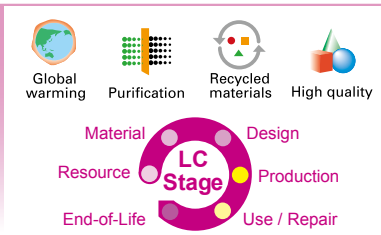
Eco-materials

EM-5-007 **Ceramics and glass**

ceramic, stone and clay products

Reefs for Coral and Seaweed : Marin Block

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_2 through a solidification reaction, has been dopted 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.



JFE Steel Corporation

2-2-3 Uchisaiwaicho, Chiyoda-ku, Tokyo 100-0011, Japan
Tel Fax
E-mail
URL http://www.jfe-steel.co.jp/

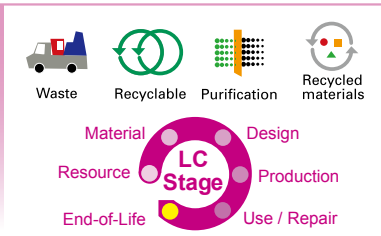
Eco-materials

EM-5-008 **Ceramics and glass**

Soil conditioner

KATATUMURI The foudation improvement material

The object for the character of the improvement--it burries and they are an object for return, and the improvement material with it covers and which it used for hardening. It is improvement material for carrying out effective use of the muddy soil,which comes out of pond, river, lake, construction site,etc,. The weak soil,and surplus soil. It solidifies enough in the amount of addition of ten to about twenty percent of the soil. Moreover, incinineral ashes,coal ashes,recycling gypsum,etc,of paper manufucture sludge are the main ingredient of this product of this itself is a recycled product. And 6 chromium is not included as a feature of this product. -PH also becomes neutrality immediately again.(non-cement)



This is a bag of 4Kg, others 10kg, 20kg, 1t.

BAIO WORTH Co., Ltd.

350, Sodai, Mino-shi, Gifu , Japan
Tel 81-575-33-2714 Fax 81-575-33-2612
E-mail s-ogawa@ogawakenzai-mino.co.jp
URL

EM-5-009 **Ceramics and glass**

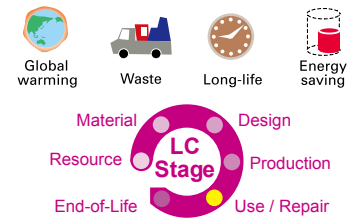
ceramic bearing balls

Ceramic Bearing Ball for Wind Turbine Bearings

Toshiba Materials Co., Ltd. has developed large ceramic balls for windmill power generator bearings, taking advantage of its unique grain-boundary control technology. They are made of silicon nitrides known to have excellent properties such as high strength, high hardness and light weight as well as longer serviceable life, making them environmentally friendly.

Unlike steel balls, ceramic balls have good insulation property enabling considerable cost reduction for maintenance work because a highly durable and reliable system can be realized that is largely free from electric corrosion.

- **Energy saving:** Reduction in energy loss through bearing rotation.
- **Resource saving:** Threefold increase in bearings' serviceable life.
- **Reduction in use of chemical substances:** Reduction in use of grease lubricant for bearings



Ceramic Balls for Windmill Power Generator Bearings

Toshiba Materials Co., Ltd.

1-1, Shibaura 1-chome, Minato-ku, Tokyo 105-8001, Japan
Tel 81-3-3457-4875 Fax 81-3-5444-9235
E-mail
URL http://www.toshiba-tmat.co.jp/

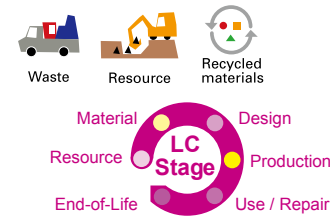
Eco-materials

EM-6-001 **Composites**

special wood products

New timber made from architectural waste of woods and logging residue

This product is a timber for pillars, beams and cores of fixtures made from architectural waste of woods and logging residue. The current waste recycling rate is about 40%, which means that about 60% of the waste is burned or used for landfill. Using this timber could increase the recycling rate of architectural waste of woods. Most of the logging residue is left in the forest. Using this timber made of wood residue is one of the solutions for forest conservation. This timber use environmental-friendly non-formaldehyde glue.



Sekisui Chemical Co., Ltd.
Urban Infrastructure &Environmental Products Headquaters

Toranomon 2-chome Tower, 3-17 Toranomon 2-chome, Minato-ku, Tokyo 105-8450, Japan
Tel 81-(0)3-5521-0776 Fax 81-(0)3-5521-0601
E-mail karukaya001@sekisui.jp
URL http://www.sekisui.co.jp/wood/

Eco Value Wood

Eco-materials

EM-6-002 **Composites**

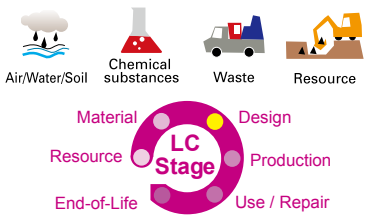
adhesives

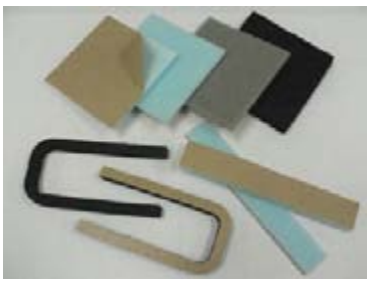
Water-based Emulsion adhesive products with various foams

These are pressure-sensitive adhesive (PSA) products which have no organic solvent. Conventional PSA has organic solvent, which is the half weigh of undiluted solution of adhesive. Therefore, conventional PSA has emitted a lot of organic solvents in the air, and caused air pollution and sick house syndrome.

New type PSA solves these problems. It has water instead of organic solvents,but its performance is equal to conventional one. It is very easy on the environment.

New PSA is applicable to various products. For example,the polyurethane foam, polyethylene foam,and EPDM foam.





Bridgestone Corporation

10-1, Kyobashi 1-chome Chuo-ku, Tokyo 104-8340, Japan
Tel 81-3-5202-6830 Fax 81-3-5202-6833
E-mail
URL http://www.bridgestone.co.jp/english/index.html

Water-based Emulsion adhesive products with various foams

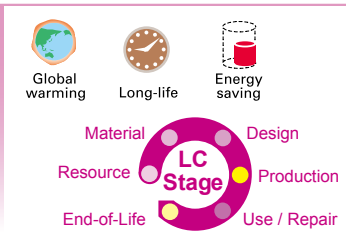
EM-6-003 **Composites**

carbon fiber

Carbon Fibers "Torayca" & Composite Materials

Used in a wide range of applications from primary structural components in airplanes to common industrial uses in automobiles and reinforcement materials and sports applications in fishing rods and golf club shafts, Toray's carbon fiber "TORAYCA" products have earned widespread recognition for their excellent performance. Toray is the largest manufacturer of PAN based carbon fibers in the world.

"Toray's Carbon Fiber Reinforced Plastic (CFRP) is a composite material made of a carbon fiber impregnated with a polymer such as epoxy resin, which is then hardened and molded. While just as strong and rigid as steel and aluminum, CFRP's have the advantage of being much lighter. When used for car hoods, propeller shafts and other components, CFRP's help make cars lighter and improve fuel consumption, thereby contributing to reduced CO_2 emissions."



carbon fiber "Torayca"

Toray Industries,Inc.

2-2-1, Nihonbashi-Muromachi, Chuou-ku, Tokyo 103-8666, Japan
Tel 81-3-3245-5115 Fax 81-3-3245-5344
E-mail Product@nts.toray.co.jp
URL http://www.toray.jp

EM-6-004 **Composites**

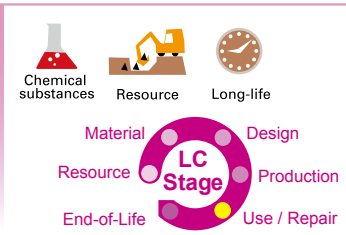
foamed urethane

Eslon Neo-Lumber FFU

Eslon Neo Lumber FFU (Fiber-reinforced Foamed Urethane) is an anti-corrosive and light-weight material that is made with formed urethane reinforced by long glass fiber strand. It is a very durable, excellent workability just like the wood, and great water resistance with much less maintenance. Therefore, Eslon Neo Lumber has been gaining a great amount of attention as to replace many conventional materials such as railroad sleepers.

Ecological aspects;
- Help preserving forest.
- LCC (Life Cycle Cost) can be reduced because of less maintenance and its excellent durability.
- Can be reused by repair.
- Can be recycled from grinding-up granules.
- Environmental impact is much less because of no termite repellents and preservatives.

preservatives. Applications;
- Railroad sleepers.
- Deodorizing lids for water treatment facility.
- Anchor walls for civil engineering.
- Water mills.
- Balconies.
- Flooring boards.
- Supporter for floor.
- Bulkheads.
- Track beds.



Sekisui Chemical Co., Ltd.

2-3-17, Toranomon, Minato-ku, Tokyo , Japan
Tel Fax
E-mail kankyo@sekisui.jp
URL http://www.sekisui.co.jp/

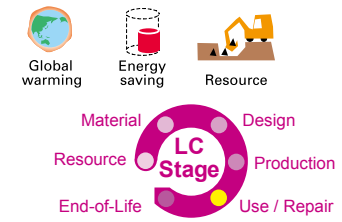
EM-6-005 **Composites**

modified rubber

Sulfron™ improves fuel consumption and enhances the durability of tires

Sulfron™, modified aramid derived from Twaron®, is a unique rubber ingredient that has been chemically processed from cut fiber and 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 a rolling resistance, which improve 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
Tel 31-26-366-4396 Fax 31-26-366-4110
E-mail Rabin. Datta@Teijinaramid.com
URL http://www.teijinaramid.com/

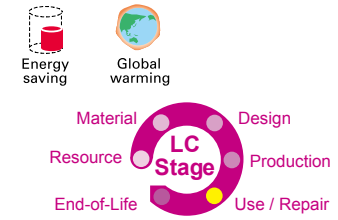
Eco-materials

EM-7-001 **Others**

paints and related products

Heat ray shielding paint with energy saving and CO_2 reduction effects

Our heat-rays shielding paint is a clear coating-material containing highly dispersed ultra-fine ceramic particles absorbing heat rays in sun light. You can apply this paint for directly coating on glass or film, and give them heat-rays shielding performance without losing their high transparency. As the paint also has good weatherability and radio-wave permeability, as well as high transparency, it has been used widely for glasses of automobile, train, and housing windows, and reduces their air conditioning load. Consequently, the application of this paint contributes significant energy-saving and CO_2 gas emission reduction.



Film coated with IR cutting paint

Mitsubishi Materials Corporation

1-6-1 Yokoami, Sumida-ku, Tokyo 130-0015, Japan
Tel 81-3-5819-7325 Fax 81-3-5819-7327
E-mail
URL http://www.mmc.co.jp/adv/

Available in : Global

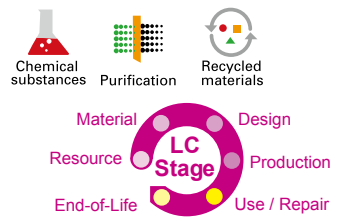
Eco-materials

EM-7-002 **Others**

polymers, plastics, plastic products

SCF(Super Clean Foam), sealing material for electromics

This is a halogen-free, phosphorous-free foam sealing material for electronics. Foam sealing material is what is put the gap for dust-proof, impingement protection, vibration isolation. Previously, halogen group flame retardants were used where high flame resistance(UL94HF-1) is required. SCF offers high flame resistance(UL94HF-1) without the use of harmful substances and also uses thermoplastic resin of high purity. The bubble diameter is as short as 80 micrometer, providing a downsized/weigt-saving approach.



SCF(Super Clean Foam)

Nitto Denko Corporation

HERBIS OSAKA,2-5-25,Umeda,Kita-ku, Osaka 530-0001, Japan
Tel 81-6-6452-2101 Fax 81-6-6452-2102
E-mail
URL http://www.nitto.co.jp

Eco-materials

EM-7-003 **Others**

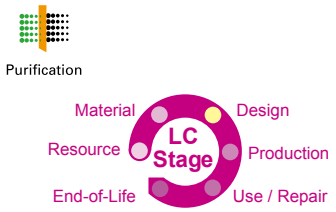
concrete blocks for construction

Environment-conscious porous concrete

Environment conscious construction method is recently required for bank protection work. Porous concrete has been developed to be a material for bank protection to content both strengthening and environmental functions.

The void size of this environment-conscious porous concrete (maximum diameter size of inscribed circle: 14mm) is about double of that of conventional porous concrete, which enables various plants and animals to live and cheap soil filling materials to be used. In spite of its large void size, its compressive strength keeps 10N/mm^2, which is necessary condition for porous concrete bank.

This product can be made from aggregate (5~40 mm) from crushed concrete. Its construction cost is reduced by operating main process within construction site. Machines, admixture and method for quality control specially provided for porous concrete realized efficient and large-scale construction.



Environment-conscious porous concrete

Kajima Corporation

6-5-11, Akasaka, Minato-ku, Tokyo 107-8348, Japan
Tel 81-3-5544-0741 Fax 81-3-5544-1733
E-mail env-act@ml.kajima.com
URL http://www.kajima.co.jp/prof/environment/index.htm

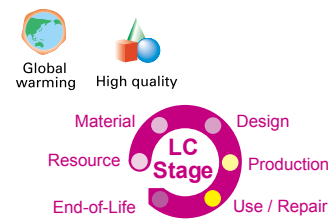
Eco-materials

EM-7-004 **Others**

non-ferrous metal products

Columnar-crystal large-diameter silicon for solar cell and semiconductor apparatus

We have developed columnar crystal silicon with the aim of using it as the parts of solar cell and semiconductor apparatus. The product is excellent in machining characteristics, mechanical strength, and chemical resistance, compared to with the poly-crystal products prepared by other methods. Moreover, it has the performance of 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 of columnar silicon crystal is rapidly increasing in the field where SiC, quartz and carbon have been used. From the view-point of the global environmental problems, the product contributes to energy saving and CO_2 emission reduction, because it is the main part of solar cell. In comparison with the competitive Si product in the same field, the product of our company is superior in the efficiency of component manufacturing owing to its large diameter. This reveals an environmentally low-load manufacturing process.



Columnar Crystal Silicon of the plate type

JEMCO Inc.

3-1-6 Barajima, Akita City, Akita 010-8585, Japan
Tel 81-18-864-6011 Fax 81-18-864-4002
E-mail
URL http://www.jemco-mmc.co.jp/index.html

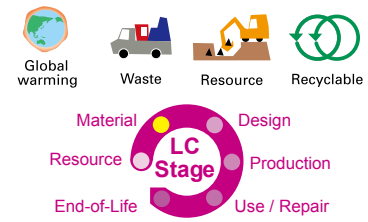
Available in : Global

EM-7-005 **Others**

alternative fuel

SlurMix®:Eco-friendly, designed for steel and cement industry

AMITA has developed an easy-to-handle auxiliary fuel called SlurMix for the steel and cement industry, made by compounding and homogenizing certain types of waste oils, oil-containing sludge and waste solvents, all by-products which previously could only be disposed through incineration. The reside remaining after combustion of SlurMix can be used as a raw material in manufacturing cement. SlurMix has about 4,500kcal/kg of calorific value so that it could be an alternative fuel of coal which leads reduction of green house gas emission and saving natural resources. This means that SlurMix ultimately results in zero waste product; it realizes 100% recyclability.



SlurMix®

AMITA CORPORATION

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E-mail info@amita-net.co.jp
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Available in : Asia