

5. Environment-Friendly Products and Recycling Technology

1) Environment-Friendly Products

To protect the environment and contribute to the realization of a sustainable society, Furukawa Electric recognizes that “the 21st century is the century of the environment,” and in response to the needs of society and our customers, is actively working to develop environment-friendly products and technologies. Our aim is to develop a range of commercially viable “environment-friendly” products—products that at every stage, from materials selection, manufacture and use to distribution and disposal, will be non-toxic and of low environmental impact.

◆ Development Concept and Representative Environment-Friendly Products

The development of environment-friendly products aimed at the reduction of environmental impact and the realization of an environment-conscious society will be carried out in accordance with the following basic concepts:

(1) Development of Products with Reduced Environmental Impact

It is essential that products not create environmental problems when they are used, but further, they should not be the source of toxic by-products when they are eventually disposed of by incineration or in landfills.

Furukawa Electric has developed an electric wire with low environmental impact which uses no PVC, other halogenous substances or lead compounds.

In the field of electronics there is strong demand for lead-free solder, and we are developing such materials.

(2) Development of Products that Contribute to Prevent Ozone Layer Depletion

We are developing devices and processes that do not use CFCs, together with products adapted to CFC substitutes. We are also developing a reflow oven that eliminates washing and use of CFCs, and refrigerant-resistant windings capable of being used in cooling systems using CFC substitutes.

(3) Development of Products that Contribute to Reducing Waste and Achieving a Recycling-Oriented Society

Waste not only causes environmental pollution, it depletes the limited stock of natural resources. We are moving to develop products that reuse waste materials, products that feature unification of materials to facilitate recycling, and products that are biodegradable and thus do not leave residual waste products. These include underground ducts made from cable waste, can stock made from recycled aluminum, biodegradable resin sheet, etc.

(4) Development of Products that Contribute to Global Warming Prevention

Through the development of products that realize energy conservations, clean energy systems and the like, we are developing products that contribute to the prevention of global warming. These include high-performance heat-exchanger materials, solar photovoltaic systems, and more. In cooperation with the Research Institute of Innovative Technology for the Earth, Furukawa Electric is conducting research on a system that can transport and store liquefied CO₂ in the sea at depths in excess of 3000 m using flexible pipes suspended from floating base-stations.

In the following paragraphs we will present examples of products based on these concepts that are providing solutions in a wide range of fields.

Typical Environment-Friendly Products

Name of product	Field of application	Stage of development*	Features
(1) Products with reduced environmental impact <ul style="list-style-type: none"> ■ ECO-ACE environment-friendly electric wires ■ Lead-free electric wires ■ Lead-free plated parts for electronic equipment 	Home appliances, power distribution, communications Automobiles Electronic parts	NP/UD NP NP	Non-halogen, lead-free Lead-free Lead-free
(2) Products that contribute to preventing ozone layer depletion <ul style="list-style-type: none"> ■ HPWR II heat- and refrigerant-resistant magnet wires ■ SALAMANDER nitrogen-atmosphere reflow ovens ■ FULL-COAT functional resin-coated aluminum sheets 	Home appliances, automotive Electronic equipment Electronic equipment	NP NP NP	For CFC substitutes Eliminates CFCs Eliminates lubricants and cleansers
(3) Products designed for reduced waste disposal and improved recyclability <ul style="list-style-type: none"> ■ Recycled aluminum can stock ■ Recycled aluminum power distribution wires ■ All-aluminum air-conditioners ■ CCBOX and Information Box underground ducts ■ BIO-ACE biodegradable resin sheets 	Cans Wire and cable Home appliances Electric wire installation Packaging materials	NP NP UD NP NP	Recycling Recycling Unification of materials Reuse of materials Biodegradability
(4) Products that contribute to preventing global warming <ul style="list-style-type: none"> ■ MCPET high-reflectivity foamed sheets ■ High-performance heat-exchanging material ■ Products containing micro heat-pipes ■ Solar photovoltaic systems ■ Deep-sea CO₂-fixing systems 	Lighting Automobiles Electronic equipment Electric power Power generation	NP NP NP NP NP	Energy conservation Lightweight, saves energy Saves energy Clean energy Reduces CO ₂

*NP = new product; UD = under development

(1) Products with Reduced Environmental Impact

■ Non-Halogenous Wire and Cable

By developing polymers and flame-retarding agents, we have achieved products free of halogens, lead and phosphorous, which permit easy disposal by incineration. Wires for electrical appliances, power supply cords, highly flame-retardant low-voltage cables, and "ECO-ACE" general cables for indoor use are already in use.



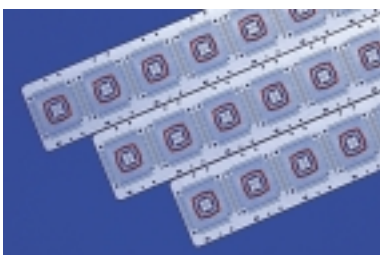
■ Lead-Free Electric Wires

By developing non-lead stabilizers for insulating resins, we have eliminated lead thereby solving the problem of lead leaching from landfills. These are already being used in automotive applications.



■ Lead-Free Plated Parts for Electronic Components

Lead-free plating for the leads of ICs, capacitors, connectors, printed circuit boards, etc. has been achieved by using a tin-bismuth alloy instead of the tin-lead material used previously, so that elimination of lead from customers' mounting process can be much improved.



(2) Products that Contribute to Preventing Ozone Layer Depletion

■ HPWR II for Use with CFC Substitutes



These heat- and refrigerant-resistant magnet wires are now in use in the compressor motors of air-conditioning and refrigerating systems using CFC-substitute refrigerants (HFC-R407C, R410A, R134a).

■ Copper Tube for Use with CFC Substitutes (Furukawa Super Clean Tube)

These are heat exchanger copper tubes with improved cleanliness in the tube's inner surface. They are for use with R134a, a new CFC-substitute refrigerant used in car air conditioners, as well as in refrigerators and the like in the future to reduce the ozone layer depletion.

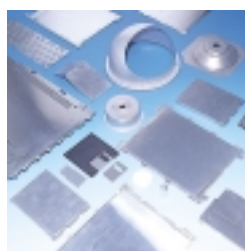


■ SALAMANDER-XN Nitrogen-Atmosphere Reflow Oven

This reflow oven carries out the reflow soldering process during the mounting of electronic components in a nitrogen atmosphere. This eliminates the need to cleanse completed circuit boards, obviating the use of CFCs.



■ FULL-COAT Functional Resin-Coated Aluminum Sheets



These functional resin coated aluminum sheets provide enhanced formability, corrosion resistance, scuff- and fingerprint-resistance, resistance to chemicals, electrical conductivity, ease of printing, and anti-bacterial and anti-mold properties. They are also self-lubricating, so that disposal of the lubricants and cleansers formerly used in the stamping process is eliminated.

(3) Products that Contribute to Reducing Waste and Achieving a Recycling-Oriented Society

■ Recycled Aluminum Can Stock

The use of can stock made from used beverage cans contributes to promoting aluminum recycling.



■ Recycled Aluminum Power Distribution Wires

We have succeeded in processing the old power distribution wire removed and retrieved by power utilities by developing techniques for sorting the aluminum wire, re-refining it and managing impurities, and remanufacturing it as wire rods and distribution wire.



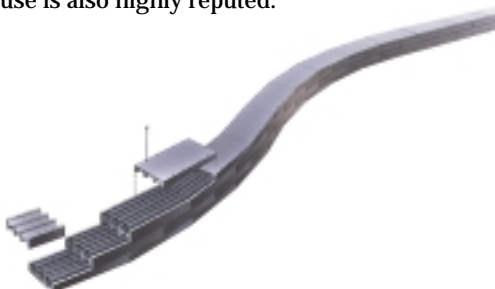
■ BIO-ACE Biodegradable Resin Sheets

When these foamed sheets used in packaging and wrapping are disposed of in landfills, they are completely broken down by the action of microorganisms in approximately one year. We have developed an environment-friendly foaming process based on our proprietary technology.



■ KOHTA KUN Underground Cable Duct Made from Cable Waste

This underground cable duct with multiple bores makes effective use of plastic waste. "KOICHI KUN" duct for information box use is also highly reputed.



(4) Products and Systems that Contribute to Preventing Global Warming

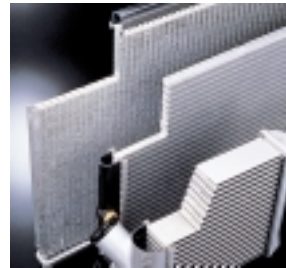
■ MCPET High-Reflectivity Foamed Sheets

Furukawa Electric is the first in the world to succeed in the commercial-scale production and marketing of white sheets made of extra-fine foamed polyethylene terephthalate (PET). Bubble diameter is so small that optical performance is outstanding, with a total reflectivity of 99% or more.



■ High-Performance Heat-Exchangers Material

High-performance internally multigrooved pipes deliver energy conservations in home and industrial air-conditioners. We have also developed aluminum radiator and air-conditioner materials for automotive applications that are lighter in weight, promoting better fuel economy and reducing CO₂ emissions.



■ Solar Photovoltaic Systems

These clean distributed power generating systems use solar batteries to convert the sun's rays directly into electricity.



■ Micro Heat-Pipes

Furukawa Electric's micro heat-pipes provide a solution to the problems of heat-dissipation and cooling of electronic equipment, making possible greater availability of computing power along with energy conservation.

