Global Promotion of Sales of Recycled Copiers Based on the “Comet Circle”

● Concept

Based on the concept of the Comet Circle that puts “Priority on Inner Loop Recycling,”* the Ricoh Group is working on recycling materials with less environmental impact and high economic efficiency. Our efforts are thus focused on the following activities (in order of priority)—recovering products, reusing parts, and recycling materials. Ricoh, with recognition that the flow from collection of used products to the recycling of materials is one business unit, is making efforts to improve profitability in the recycling business on a global scale. Improvement of profitability will make continuous activities to reduce environmental impact possible. *See page 8.

● Targets for Fiscal 2004

◎ Improve the quantity of reusable parts used by a factor of at least 20 (compared to fiscal 2000, in Japan)
◎ Improve the collection rate of used products and toner cartridges by at least 10% in terms of the number of units collected (the Ricoh Group as a whole, compared to fiscal 2000 figures)
◎ Increase the number of resource-recirculating-type products marketed by a factor of at least 20 (in Japan, compared to fiscal 2000 figures)
◎ Improve the resource recovery rate for used products and toner cartridges.

Products

Japan: 98%, Europe: 85%,
The Americas: 95%,
Asia-Pacific: Over 85%

Toner cartridges

Japan: 98%, Europe: 85%,
The Americas: 100%,
Asia-Pacific: 85%

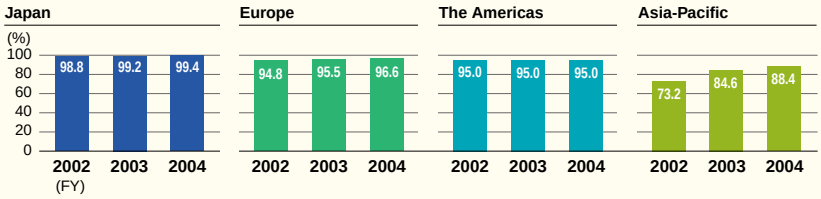
● Review of Fiscal 2004

The number of used products and toner cartridges collected and the resource recovery rate are increasing steadily (see graphs ❶ through ❹). Ricoh will continue to promote highly efficient collection and resource recovery methods. In fiscal 2004, the imagio Neo 350RC/450RC series (resource-recirculating-type products with an excellent energy-saving function) was put on the market. The sales of resource-recirculating-type products increased by a large margin (24.3 times that marketed in fiscal 2000) and the goal was attained.

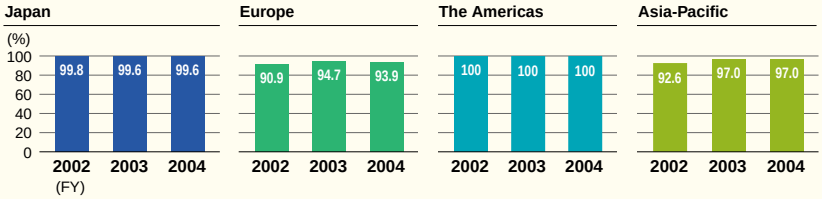
<Global>

Resource Recovery Rate

❶ Copiers

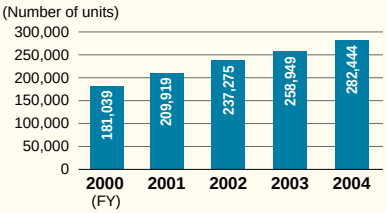


❷ Toner Cartridges

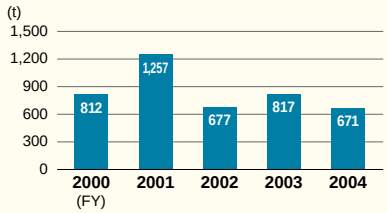


Collection Results

❸ Number of Copiers Collected



❹ Amount of Toner Cartridges Collected*



* Up to fiscal 2001, the amount of collected toner cartridges included the weight of the remaining toner inside the cartridges. In fiscal 2002, however, the calculation method was improved so that only the weight of the toner cartridges is included.

Segment Environmental Accounting of the Product Recycling Business (Japan)

Costs		Effects			
		Economic benefits		Effect on environmental conservation	
Items	Costs	Items	Benefits		
Product recycling cost	¥682 million	Sales	¥3,034 million	Amount of resource recovery: 33,096 (t) Up 3,868 (t) from that in the previous year	Amount of final disposal: 177 (t)
Collection/resource recovery cost	¥2,893 million	Social effect	¥2,648 million		
Total cost	¥3,575 million				

* Social effect refers to the cost of waste disposal that customers no longer have to pay.

● Future Action

Ricoh will endeavor to offer products that have low environmental impact and cost by improving the rate and quality of the method employed to collect used products and increasing the number of resource-recirculating-type products manufactured and marketed. Through these activities, the company will further promote improvements in profitability in its recycling business.

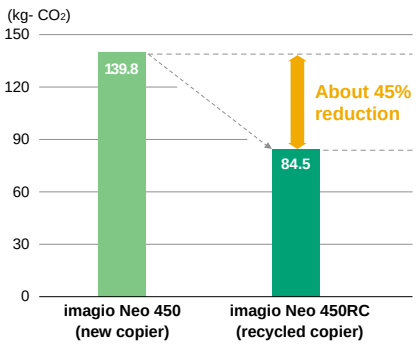
More Recycled Copier Models Available and Increased Sales

<Ricoh (Japan)>

Since the launch of the recycled digital copier, imagio MF6550RC in December 2001, Ricoh has increased the number of models available. In fiscal 2003, recycled machines with a copying productivity ranging from 35 pages/min. to 70 pages/min. became available, making it possible to meet the needs of a wider range of customers. In fiscal 2004, the new recycled digital copier imagio Neo 350 RC/450RC was added to the lineup. This new model is equipped with Ricoh's original QSU energy-saving technology that improves energy consumption and gives a fast warm-up period of only ten seconds. By responding to the needs of more customers, Ricoh has steadily increased sales of recycled machines. Because more than 82% (mass ratio) of the parts used in recycled machines are recycled parts, the imagio Neo 350/450RC gives around a 40% reduction in environmental impact over its whole lifecycle.

Imagio Neo 450RC, a recycled digital copier with optional equipment

❺ LCA Comparison Between a New Machine and Recycled Copier (CO_2 Emissions)



* A comparison is made by calculating the annual environmental impact of new and recycled copiers over a five-year-period and ten-year period, respectively.
* Figures for CO_2 emissions by copiers in operation at customer sites were not included in the calculation of the data.

INTERVIEW ⟹ Customer feedback

Introduction of Recycled Digital Copiers — Suita City, Osaka

"I am convinced of the importance of using recycled machines to promote the establishment of a recycling-based community."

Mayor **Yoshio Sakaguchi**

Fulfilling administrative social responsibility

Suita City encourages its citizens to get involved in establishing a sustainable community. Suita Environmental University for Senior Citizens is a good example of the integration of what citizens would like, what corporate entities are capable of doing, and what administrative authorities are supposed to do. Because we are supported by such companies as Ricoh in operating the university, we are both, in a way, fulfilling our social responsibilities.

How did we come to use recycled copiers?

Recycled copiers have a limited market, and people do not have a sufficient understanding of recycled products. Under such circumstances, the public sector needs to set an example for society by purchasing environmentally-friendly products. This is what administrative authorities can do in assuming social responsibility. We asked Ricoh to attach special stickers on its recycled copiers to help our personnel become more aware of the situation. (Of the 221 Ricoh copiers that Suita City uses, 76 are recycled.)

Expanding the Production Line for Recycled Machines

<Ricoh Thailand Ltd. (Thailand)>

Ricoh Thailand Ltd., established as a sales company, started full-scale production of recycled machines in fiscal 2003 for sale within Thailand. In fiscal 2004, the production line for recycled machines was expanded and improved to cope with an increase in the number of used products collected. By redesigning the production process and designating staff specifically to be in charge of work checks, work instructions, recycling, and overall process management, the company has succeeded in producing high-quality recycled machines efficiently. More than 40% of recycled machines produced in the Asia-Pacific region are manufactured by this company.

Production line for recycled machines at Ricoh Thailand

Production of Reconditioned Machines by a Sales Company

<Ricoh UK Ltd. (United Kingdom)>

In order to provide high-quality recycled products to the entire European market, the European Ricoh Group integrates products used in the European market at the European Green Center in the Netherlands. Used products collected at the center are recycled at Ricoh UK Products Ltd., a production site in the United Kingdom, to be sold as recycled machines and toner cartridges with the manufacturer's guarantee. Ricoh UK Ltd., a sales company in the United Kingdom, opened the UK Green Center in January 2004. The center produces reconditioned copiers of the same quality as those produced at plants by combining Ricoh UK Products' know-how and the field experience of Ricoh UK Ltd.

European Countries Establish Framework to Cope with the EU WEEE Directive

<Ricoh Family Group (RFG) (Europe)>

In accordance with the WEEE Directive*, manufacturers are required to collect and recycle office equipment at end-of-life. RFG is committed to building and operating recycle systems for office equipment. Using the expertise and infrastructure it has developed thus far, RFG works with not only the office equipment industry but with all electronic industries, such as Consumer electronics associations as well as recycling and logistic companies in all 25 EU countries to create systems that will ensure compliance with the local WEEE implementations. Users can return products to collection facilities or salespoints at end-of-life, and they are then collected and recycled by designated recycling companies. Collection and processing cost are financed by producers according to their market share. Already systems are in use in the Netherlands, Belgium, Switzerland, and Norway.

* EU Waste Electrical and Electronic Equipment Directive

Building Multi-tiered Collection Routes with Post Offices

<Lanier (Schweiz) AG (Switzerland)>

Lanier (Schweiz) AG, a sales company, has built a system that allows customers to return used toner cartridges via post offices free of charge. This system is based on the policy "customers can return everything they buy from Lanier to Lanier." Prepaid labels are enclosed in packages and can be downloaded from internet. Thanks to the system, more customers are now able to cooperate in the collecting and recycling process more easily. Since start of this program in November 2003 a monthly increase from 20% customer returns in average were reported. Of the used cartridges collected, those that can be reused are sent to the European Green Center to be sold as recycled products. Those that cannot be reused undergo material recycling by domestic recycling companies.

Special sticker attached to the corner of a collected package

Printer Cartridges Now Returnable through the Mail

<Ricoh (Japan)>

In addition to the normal collection route via sales companies and dealers, used cartridges for GELJET printers can now be returned through the mail. Users put the used cartridge into a collection envelope distributed with the original packaging and drop it into a mailbox. This new approach allows users to cooperate more easily in returning used cartridges. Ricoh makes donations to environmental groups from the results of collecting used cartridges through the mail. The first donation was to the Green Earth Network's "Magpie Forest" afforestation project (Huangtu Plateau in China), as a result of the savings from the collection scheme from February to September 2004.

Employee feedback

INTERVIEW — Promoting Innovations in Packaging

"Ricoh aims to develop its reusable resource-recirculating eco-packaging even further."

Tomoaki Arai
Group Leader
No. 3 Design Group
No. 1 Design Office
Designing Center
MFP Business Group

From eco-packaging materials to recyclable eco-packaging materials

"With increasing concern over packaging waste, highlighted by the ratification of the Container and Package Recycling Law in April 2000, Ricoh decided to improve the eco-packaging that it first introduced in 1994. While conventional eco-packaging aims to reduce the use of cardboard, the new packaging concept is to use recyclable materials. The package developed initially was of the metal frame type, but this could not be successfully mass-produced due to lack of versatility. Resource-recirculating eco-packaging using plastic materials was first introduced in January 2001, and today about 50% of copiers manufactured in Japan are shipped in this packaging."

Breaking the cost barrier

"Challenges in the design of new packaging take the form of composition of parts, cost, strength, durability, and versatility. Important points in organizing the new packaging system are creating an efficient collection system and maintaining the parts. The most difficult challenge was cost. Although some people think that cost is not a problem if this is offset by increased durability, longer depreciation periods may increase the overall risks. Team members engaged in developing the new packaging made strenuous efforts to respond to the request for the depreciation periods to be as short as possible and for the total costs—including manufacturing, collecting, and maintaining the parts—to be kept to the same level as conventional packaging."

Strengthening the product as well as its packaging material

"Moreover, while conventional packaging materials are only required to protect the product once, resource-recirculating eco-packaging must be able to withstand repeated use. Therefore, in addition to evaluating the strength of product packaging, it became necessary to evaluate other factors such as environmental deterioration, and durability of the packaging materials. And there was still another issue to be tackled. Since cushioning materials are not used in resource-

Reusing OPC Aluminum Tubes
<Ricoh (Japan)>

In March 2003 Ricoh started recycling photosensitive drums (OPCs: organic photo conductors), which form the heart of its copiers and printers. An OPC consists of an aluminum tube and photosensitive layer made of an agent mixed with resin and applied to the tube's surface. Since it was difficult to successfully separate the layer from the tube on used OPCs, materials recycling was adopted. Ricoh developed a new technology to separate and clean the photosensitive layer, and succeeded in separating all types of OPCs, regardless of how long they had been in use. This technology enables collected OPCs to be reused. In fiscal 2004, 26,000 recycled OPCs were delivered during the year, which gave a reduction of 7.7 tons of aluminum alloy, the material of the tubes. These efforts contribute to a reduction of 71.3 tons of CO_2 a year.

Recycling Process for Used OPCs

Eco-packaging

Conventional resource-recirculating eco-packaging introduced in 2001

Conventional resource-recirculating eco-packaging
The new user-friendly eco-packaging, launched in January 2005, can be refolded after being collected.

recirculating eco-packaging, the product needs to be stronger as well. It is clear, then, that the development and use of eco-packaging consists of more than just designing the packaging. It is an innovation that cannot be implemented without cooperation between suppliers and the whole Ricoh Group, and encompassing product design, distribution, and dealers. Ricoh is striving to advance the evolution of packaging."

Development staff

Satellite Filling Promotes the Reuse of Toner Bottles
<Ricoh (Japan)>

Ricoh has introduced the satellite filling concept to promote the reuse of toner bottles. In this system, instead of returning the collected toner bottles to the production site, bottles are recycled and filled with toner at a collection center close to the customers and the recycled bottles are shipped from the center. This new filling system reduces the environmental impact of transporting the bottles and shortens the lead time. Satellite filling has become possible thanks to the development of our small On-Demand Toner Filling Machine. In fiscal 2004, the new filling system was launched in the Kyushu, Tokai, Kanto, and Tohoku areas, and 320,000 toner bottles were shipped during the year. It is planned to expand satellite filling to the Kinki, Chugoku/Shikoku, and Hokkaido areas in fiscal 2005, to cover the whole of Japan. In terms of LCA evaluation, recycled toner bottles, which reduce the environmental impact of production and transportation, cut CO_2 emissions by 87% compared with new products.

In only a small space, anyone can easily refill with toner.