Resource Conservation and Recycling (Products)

◎Concept of Resource Conservation and Recycling

The Ricoh Group, under its Comet Circle concept, is developing environmental conservation activities, aiming at realizing a society that recirculates resources. In the Comet Circle, the smaller the loops get the less environmental impact there is*. The Ricoh Group develops higher-level recycling and reuse measures for environmental conservation, focusing on the inner loops of the Comet Circle for product recycling activities that have lower environmental impact and higher economic efficiency. Ricoh introduced a recyclable design system in 1993 and is aggressively working to establish it throughout Japan, starting with an overall recycling plan in fiscal 1998. In 1997, we introduced the spirio 5000RM, the first RM copier. With the goal of making the recycling business economically feasible by the end of fiscal 2004, we are engaged in expanding the reuse of products and promoting the use of recycled (RC) machines as well as improving the level of recyclable design.

*See page 7.

Goals and Progress

- Establish a collection and recycling system for products and supplies, especially toner cartridges, in Japan, Europe, the Americas, China and Taiwan, and the Asia-Pacific region by the end of fiscal 2001.

▶**Product Collection and Resource Recovery System**

Nineteen collection centers and six recycling centers are in operation in Japan. A nationwide system is scheduled to be established by the end of fiscal 2000. Preparations for a similar system are underway in Europe, the Americas, China and Taiwan, and the Asia-Pacific region.

▶**Toner Cartridge Collection System**

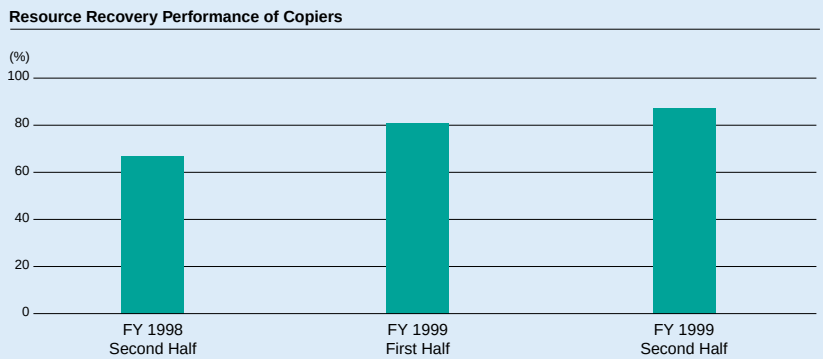
A toner cartridge collection system is in its final stage of completion in Japan, Europe, and the Americas. Preparations for a similar system are underway in China and Taiwan and the Asia-Pacific region.

▶**Resource Recovery System for Toner Cartridges**

In Japan, Europe, and the Americas, toner cartridges are recovered and a resource recovery system is being constructed. Preparations for a similar system are underway in China and Taiwan and the Asia-Pacific region.

- Increase the resource recovery rate for copiers, facsimiles, and laser printers, including toner cartridges, to 90% or more by the end of fiscal 2001.

▶The copier resource recovery rate in the second half of fiscal 1999 was 87% in Japan. Efforts to achieve similar results are being made overseas.



Overall Recycling Plan

Recycling begins at the product development and design stages, not at collection. Ricoh's product recycling is based on the idea that environmental impact reduction and economic values should be pursued equally. In 1990, we began looking into introducing an Overall Group Product Plan, in which parts can be used in different products, to promote the effective use of resources and the reduction of cost. Such interchangable parts can be recycled in new machines. In fiscal 1998, to improve the efficient recycling of products, this system was integrated into the Overall Recycling Plan, which designates in advance which parts are for reuse and recycling. In the future, we plan to design parts and products that will be able to be reused no matter which generation they are from.

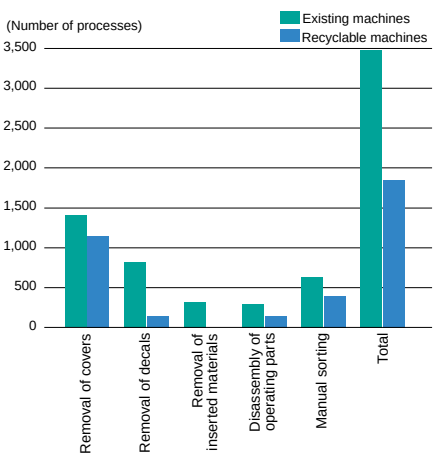
Recyclable Design

In 1993, Ricoh announced its policy on recyclable designs, and in 1994 it introduced the spirio 2700 series, the first line of copiers based on the recyclable design. The spirio 2700 series was designed to significantly reduce the time and cost it takes to disassemble a copier and sort the materials after collection (e.g., fewer screws used in the machine and more-consistent plastic materials). The Ricoh Group expanded its policy on recyclable designs and product assessment to cover its entire line of copiers, facsimiles, and laser printers in 1993. Furthermore, we improved the level of recyclable designs, which resulted in higher economic benefits.

●Provisions for Recyclable Designs

1. Provision for the reuse of products, units, and parts
2. Provision for the recycling of materials
3. Provision for the recycling of chemicals
4. Provision for the recovery of energy
5. Provision for the reduction in size and weight of products
6. Provision for the reduced use and recycling of packaging materials

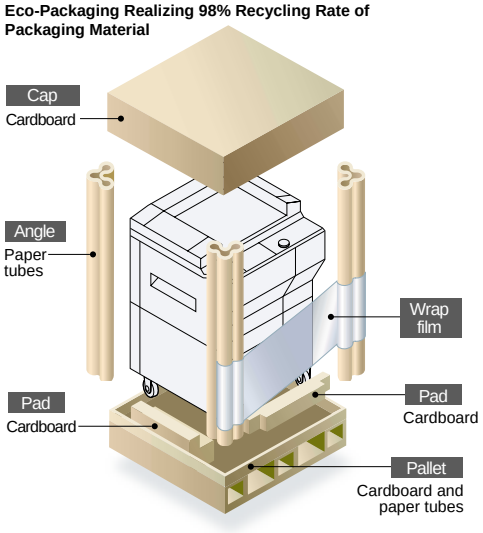
Comparison of the Disassembly and Sorting of Existing and Recyclable Machines



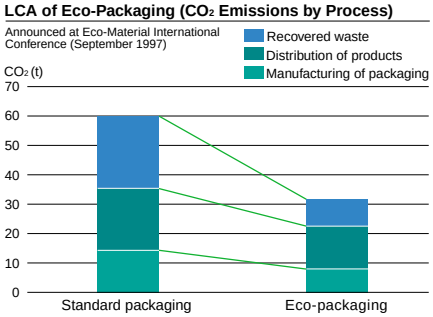
Eco-Packaging (Resource Conservation of Packaging Materials)

It is important to conserve resources used in not only products but packaging materials as well. In 1994, Ricoh developed eco-packaging, which consists mainly of laminated cardboard that can be easily disassembled and sorted and is 98% recyclable. In the past, packaging materials used for such products as copiers were made of composite materials, including wood, cardboard, and polystyrene foam, and were difficult to disassemble and sort. Therefore, most of the disposed materials were either burned or buried. By 1997, Ricoh had already packaged more than 180,000 copiers with eco-packaging and shortened transportation routes in Japan. This has helped cut CO_2 emissions produced in transportation and the burning of packaging by half. The amount reduced is equivalent to the amount of CO_2 generated by burning more than 9,000 200-liter barrels of heavy oil. Ricoh is investigating the usage of eco-packaging worldwide as well as other product packaging and transportation systems that have less environmental impact.

Eco-Packaging Realizing 98% Recycling Rate of Packaging Material



LCA of Eco-Packaging (CO_2 Emissions by Process)



Strength Tests of Products and Packaging Materials

Even though our goal is to simplify packaging, it is important to ensure that the products themselves are strong enough to withstand damage during shipping. Based on Ricoh's recyclable design policies, product strength tests are mandatory. Such tests are conducted at the Product Resistance Evaluation (P.R.E.) Laboratory, which is equipped with the latest test devices, such as a horizontal shock tester and a vibration tester. Ricoh's P.R.E. Laboratory was the first facility built by a Japanese manufacturer to have been officially recognized by the International Safe Transit Association (ISTA). Measurements obtained here are internationally recognized.

A package's strength is being tested against vibrations.

A package's strength is being tested against shock.

Reconditioning of Copiers

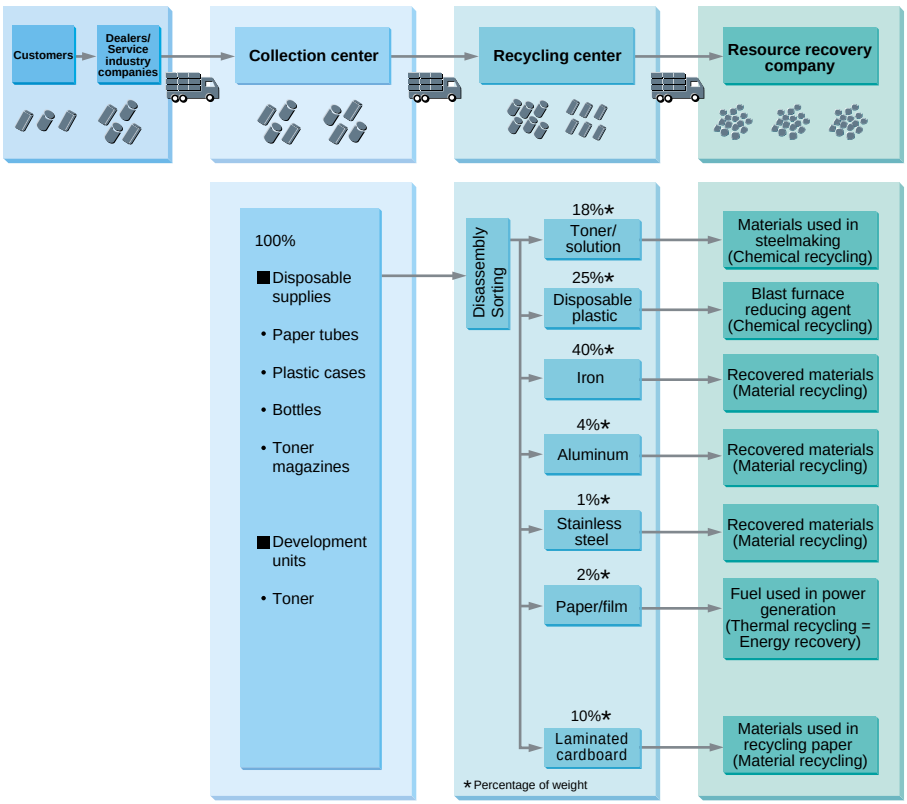
As part of its environmental conservation activities, Ricoh actively sets out to collect used products. We set new standards of quality for used products that have been reconditioned, with all necessary parts replaced, for the purpose of being rented out to customers. The quality of these reconditioned (RC) products are guaranteed by Ricoh as being environmental conservation products that significantly reduce environmental impact.

Recycling of Plastic Parts

Plastic parts account for approximately 20% of the weight of such OA equipment as copiers. The quality of plastic drops when different types or grades of plastic are mixed, and because such plastic materials cannot be reused for copier parts, they are difficult to recycle. For this reason, Ricoh began indicating, in 1994, the exact type and grade of materials used in each part according to the company's recyclable design policies. In 1999, Ricoh established 10 grades of plastic—seven for virgin materials and three for recycled materials—to help improve the recycling rate of collected products. Plastic parts removed from products collected at recycling centers are sorted, graded, and crushed. They are then mixed with virgin plastic to be reused in Ricoh product parts. Ricoh's recovered plastic parts contain a relatively high rate of collected plastic, up to 30%, with the remaining 70% made up of virgin plastic. The average amount of recovered plastic in any given part is 20%–25%.

Plastic parts material grading

Resource Recovery Flow of Used Supplies



Collection, Recovery, and Recycling of Copier Toner Cartridges

Full-scale collectin of all office supplies, such as toner cartridges, started in 1998. Ricoh is now expanding its collection and recycling system nationwide. We continually strive toward recovery and recycling activities that are more economically efficient by running simulations on the disassembly, sorting, cleaning, and reassembly of toner cartridges targeted for reuse. Aiming at improving the resource recovery rate to 100%, Ricoh is working with NK Kankyo Corporation, and Mansei Corporation to develop technologies that can be applied to all kinds of supplies, including toner, ink cartridges, and bottles. In April 2000, the completion of preparations for a center to recycle office supplies in the Kanto area was a step towards establishing a nationwide network by the end of fiscal 2001.

Nationwide Recycling System

To effectively reduce environmental impact, it is necessary to establish a nationwide recycling system as well as improve recovery and recycling technologies. Ricoh is cooperating with collection centers, recycling centers, recovery centers, and plastic manufacturers in establishing a nationwide network to facilitate more economically efficient recovery and recycling.

● Collection Centers

Ricoh Logistics has 19 collection centers across the nation to collect used products from 670 dealers, agents, and consumers. Furthermore, to reduce cost and improve the efficiency and quality of collection operations, a vehicle allocation system using the company's product collection order information is being established. This integrated system is scheduled to be in full operation by the end of fiscal 2000.

●Recovery Centers

Some of the used products and parts collected at collection centers are earmarked and sent to recovery centers to be recovered and reused. Business sites and Group affiliates that manufacture such products and parts act as recovery centers.

●Recycling Centers

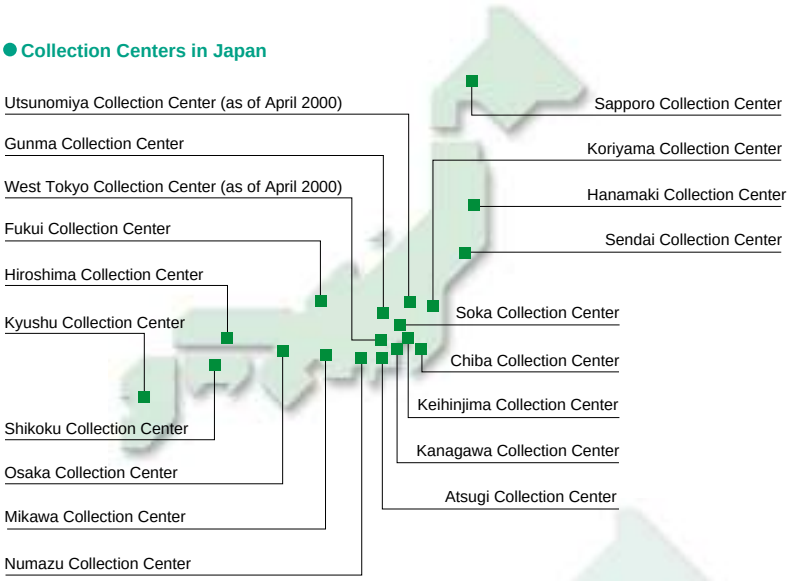
Recycling Centers disassemble used products collected at collection centers and sort out the parts that are to be reused. Next, the plastic parts are graded, crushed, and sent to subcontractors to be used in the manufacture of parts for Ricoh products. Recycling centers are in operation at six locations: Hokkaido, the northern and southern Kanto and Kansai areas, and Kyushu. Additional centers are scheduled to open in other parts of the country by the end of 2000.

●Recycling Information Sharing System

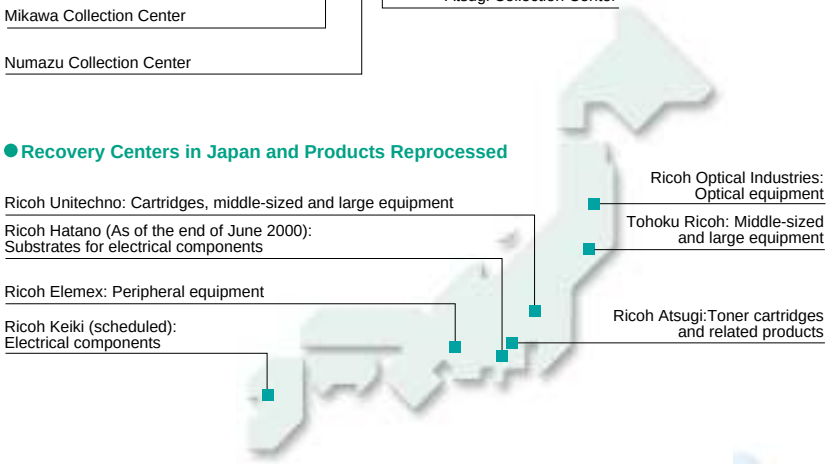
Ricoh is setting up a system in which the company can share information on used products with recovery and recycling centers. To retrieve information on a particular product, all a center has to do is enter the model code of the recovered product it is interested in. It is important for recovery and recycling centers to be familiar with their inventory because used products are, in fact, their resources or materials. This information sharing system uses bar codes to track all products and is designed to operate as a part of the environmental impact information system*.

*See pages 17-18.

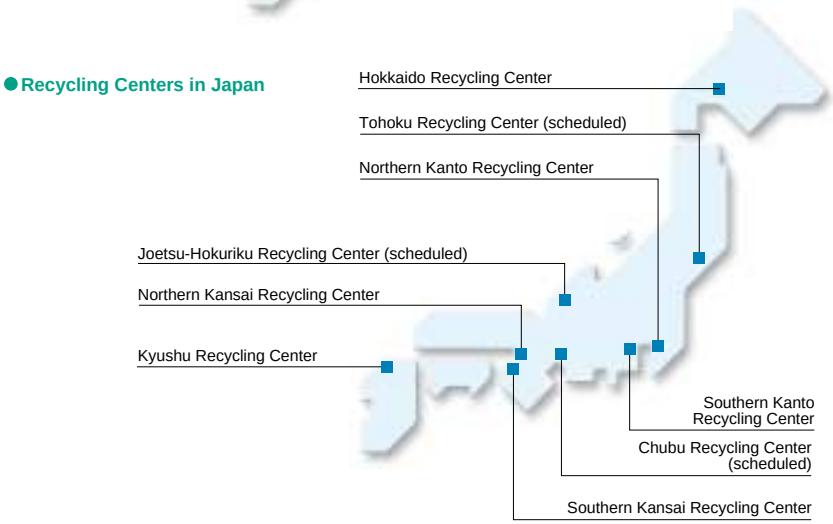
●Collection Centers in Japan



●Recovery Centers in Japan and Products Reprocessed



●Recycling Centers in Japan



Kyushu Recycling Center

RM Copiers

In October 1997, Ricoh marketed a copier called the spirio 5000RM. The spirio, like other RM copiers, incorporates recycled parts. More than 60% (mass ratio) of the RICOPY FT5500 series that was marketed in 1993 was reused as parts in the 5000RM. All 5000RM units are manufactured using recycled parts, including the inner cover, which is made from recycled plastic. Performance of the copier was enhanced by making the liquid crystal panel easier to see. Following the spirio 5000RM, Ricoh marketed other RM models, such as the spirio 7210 series and the spirio 8210 RM.

spirio 5000RM

The Ricoh Recycle Label

In order for its products to be quickly recognized as having less environmental impact, the Ricoh Group uses the Ricoh Recycle Label, which ensures compliancy with Group standards on recyclable designs, the reuse rate of parts, the collection system, resource recovery, and environmental safety. As of March 2000, five models, including the spirio 5000RM, spirio 7210RM series, spirio 8210RM, and spirio 105BB, have been sold with this label.

Criteria for the Ricoh Recycle Label (Summary)

1. The product satisfies Ricoh's recyclable design standards
2. Reused* parts account for 40% or more of the product's mass (mass ratio)
3. Toner cartridges used in the product are recyclable, and a system for recycling them has been established.
4. A system for collecting and processing used products as well as collecting used cartridges and containers has been established.
5. At least 90% of the product's mass (mass ratio) can be recovered and recycled in Ricoh's recycling system.
6. Consideration is given to environmental safety, as stipulated in Ricoh's standards.

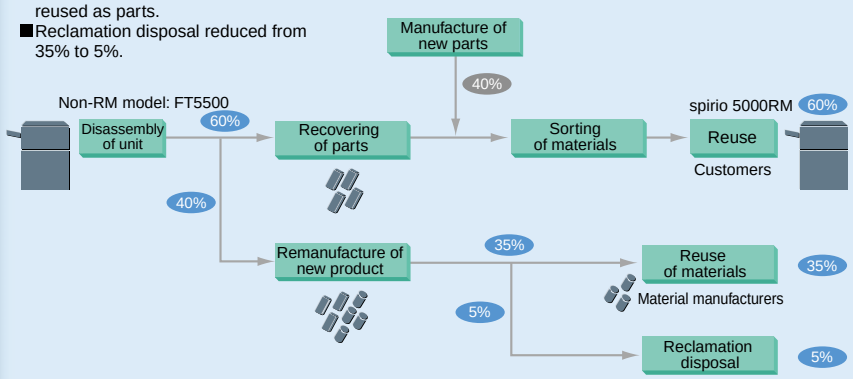
*Reuse means to use something for the same purpose in its original form.

Recycle

Recycled Parts Used in the spirio 5000RM

Results of using collected parts

- 60% of the RICOPY FT5500 series reused as parts.
- Reclamation disposal reduced from 35% to 5%.



Environmental Accounting for Ricoh's Recycling Business

The cost of recycling is an important issue for manufacturers because they are considered responsible for the collection of used products. By following its policy on recyclable designs in 1993, Ricoh has taken cost-efficient approaches early on by improving the collection routes of its products and by establishing a recycling system. As a result, we were able to successfully market RM copiers made from 60% or more (mass ratio) collected parts from used copiers. The cost-efficiency of Ricoh's recycling business is expected to be directly proportional to the increase in the number of collected units. Improvements at the recycling design level will lead to an improved recycling efficiency of collected products.

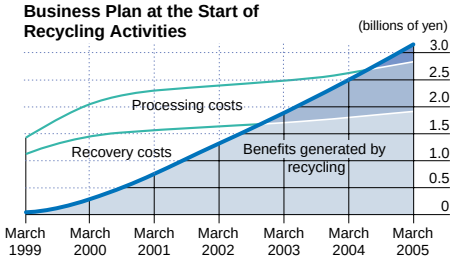
Environmental Accounting for the Recycling Business of the Ricoh Group (including dealers) in Fiscal 1999

(millions of yen)

Costs		Effects		
		Economic benefits		Environmental conservation effects
Recovery	877			
Processing	1,157			
Necessary expenses	455	Sales	408	Resource recovery rate (copiers) 87.3%
Total	2,489			

*The resource recovery rate as of the end of fiscal 1998 was 67.0%. The rate was significantly improved by the end of fiscal 1999.

Business Plan at the Start of Recycling Activities



Recycling Activities around the World

In March 2000, Ricoh Group representatives from five regions around the world gathered in Tokyo for the 1st Conference on Global Environment and Recycling. The conference was held to examine the recycling promotion activities of the Ricoh Group as a whole, share information on global issues, and horizontally develop groundbreaking activities. The Americas, Europe, and Japan had an early start in developing recovered machines that reuse parts collected from used products. In the Americas, fewer products are returned to Ricoh Group members for collection than in China and Taiwan or the Asia-Pacific region, which achieved relatively high rates of collection and recovery. The collection of toner cartridges began in 1995 in Japan and the Americas and in 1999 in Europe. Each of these regions has also started recovering cartridges. China and Taiwan will follow in November 2000.

Recycling of Photosensitive Drums

Ricoh's production-related subsidiary in the United Kingdom, Ricoh UK Products, had earlier undertaken the recycling of products. In particular, its multilayer recycling system for reusing the main part of the copier—the photosensitive drum—has received high acclaim, winning the Queen's Award in the U.K. in 1993 and the European Better Environment Award for Industry in 1994.

Recycling of products at Ricoh UK Products

New Approaches toward Resource Conservation

To more effectively reduce environmental impact, the Ricoh Group began promoting "From One R (recycle) to Three Rs (recycle, reduce, reuse)," i.e., in addition to recycling products and materials, one needs to reduce resource exploitation and reuse collected parts and units. We are in the process of creating new design policies and a system for the future manufacturing of copiers.

Developing Products Based More on Reuse than on Recycling

Ricoh turns recyclable designs into reuse-oriented designs. Copiers are sorted by unit and job, i.e., paper loading, paper feeding, and ink fixing, following fixed standards for unit size and interunit interfacing. We are able to upgrade machines by simply replacing units and parts with newer ones that are better suited to meet the needs of the times. Accordingly, it may soon be possible to have your machine upgraded right in your own office instead of having to purchase a new one.

The Concept of Reuse Will Affect Manufacturers As Well As Products

If the concept of reuse takes hold in society, manufacturers will no longer be providing products but rather functions or services contained within those products. Furthermore, manufacturing strategies will gradually shift from those based on recycling, i.e., focusing on how to reuse things, to those based on life cycles, i.e., focusing on the entire life cycle of products and the manufacturing of those products. Under the concept of reuse, manufacturers will become "life cycle service providers."

Units designated by Ricoh are removed for reuse.

Plastic materials made from disassembled and sorted plastic parts will be categorized into three grades to be reused in manufacturing other Ricoh products.

Ricoh Kyushu's Recycling Center: the Recycle Tech

Resource Conservation and Recycling (Business Sites)

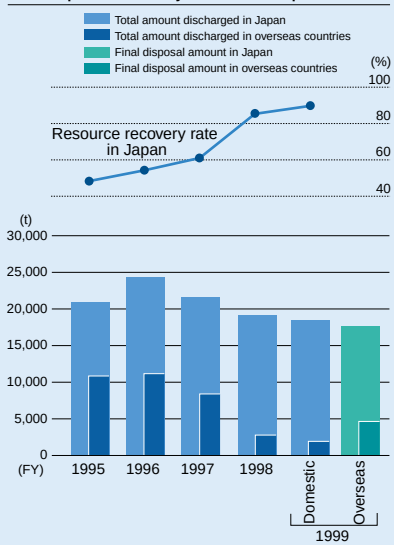
◎Zero Waste Plants and Perfect Production

What kinds of waste are generated at plants? Most are extra raw materials that were not needed in manufacturing a product. If production sites would use only the amount of raw materials needed to make their target number of products without any being left over, wastes would be minimized with no loss in energy or personnel expenses. Our goal is not just to establish such zero waste activities but to continue them. First of all, the Ricoh Group's comprehensive "entrance management" of plants regarding materials procurement centers on the concept of preventing wastes from being generated instead of being recycled. We pay close attention to ways in which we can reduce the environmental impact of the packaging used for our finished parts and products while improving the productivity of production lines. All our activities are carefully planned to realize perfect production (achieving maximum results with minimum resources) and the kind of ideal plant our customers expect us to be.

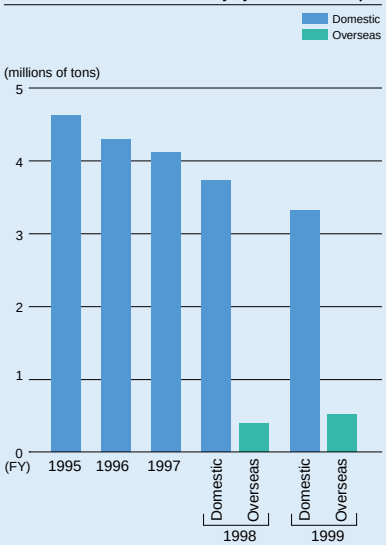
Goals and Progress

- Ricoh is to reduce final waste 90%, compared with that of fiscal 1992, by the end of fiscal 2001.
- ▶ In fiscal 1999, final waste was reduced 89.4%.
- Achieve a 100% resource recovery rate (zero waste) at all domestic production sites by the end of fiscal 2000.
- ▶ As of March 2000, seven business sites (Ricoh Fukui, Ricoh Numazu, Ricoh Gotemba, Ricoh Hatano, Ricoh Atsugi, Ricoh Unitechno, and Part Component System's Sagamino Plant) achieved zero waste. All business sites are to achieve zero waste by the end of fiscal 2000.
- Achieve a 70% resource recovery rate at all domestic nonproduction sites by the end of fiscal 2000.
- ▶ Achieved 59.6% in fiscal 1999.
- Achieve a 100% resource recovery rate (zero waste) at all overseas production sites by the end of fiscal 2001.
- ▶ As of fiscal 1999, zero waste has not been achieved at any site. However, Ricoh Industrie France continues to achieve a 99% resource recovery rate.

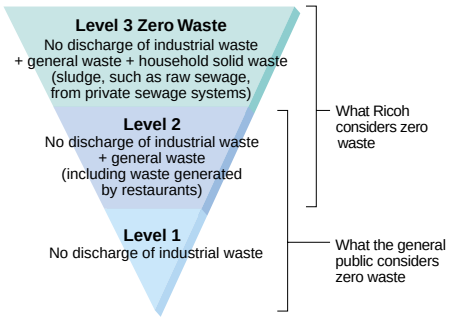
Resource Recovery Rate/Amount of Waste Discharge/ Final Disposal Amount by the Ricoh Group



Volume of Water Used in Industry by the Ricoh Group



Definition of Zero Waste Levels



The Ricoh Group's Zero Waste Achievements (Fiscal 1999 Results)

Ricoh Fukui	Level 3
Ricoh Numazu	Level 3
Ricoh Gotemba	Level 2
Ricoh Unitechno	Level 2
Ricoh Hatano	Level 2
Ricoh Atsugi	Level 2
Part Component System's Sagamino Plant	Level 2

◎Zero Waste by the Ricoh Group

The Ricoh Group classifies zero waste (100% resource recovery rate) into three levels. Although zero waste is roughly defined as no industrial waste being generated (level 1), the Ricoh Group aims at also eliminating general waste (level 2) and household solid waste, such as sludge (e.g., raw sewage), from private sewage systems (level 3). Ricoh

Recycling Examples (Some activities at the Ricoh Numazu, Ricoh Ikeda, and Ricoh Fukui plants)

Classification	Type of Waste	Product	After Recycling
Level 3 (Industrial waste + general waste + household solid waste) / Level 2 (Industrial waste + general waste) / Level 1 (Industrial waste)	Paper	Unusable copier paper	Recycled copier paper and toilet paper
	Wood	Used pallets	Particle boards
	Metal	Swarf and cutting scraps	Recycled metal
		Aluminum tubes of photosensitive drums	Automobile parts
	Liquid	Fluoroboric acid waste liquid	Fluorite
		Ammonium sulfate	Raw materials for paint (deep blue color)
		Acid solvent	Recycled oil
		Diazo compound liquid waste	Recycled zinc
	Sludge	Sludge	Cement
		Toner waste	Toner bottle caps and reducing agents
	Plastic	Ribbons and film	Solid fuel and reducing agents
		Other plastic waste	Roadbed materials
Level 3 (Industrial waste + general waste + household solid waste) / Level 2 (Industrial waste + general waste)	Flammables	Laminated cardboard	Laminated cardboard
		Wooden boxes	Particle boards
		Polyethylene terephthalate bottles	Business cards, work clothes, and plastic folders
		Cigarette butts, tissue paper, etc.	Fuel (incinerated residue=fused slag)
		Newspapers and magazines	Toilet paper
		Paper cups	Recycled paper cord
		Disposable wooden chopsticks	Particle boards
	Nonflammables	Bottles; porcelain; and glass waste, such as fluorescent lamps	Permeable blocks, glass wool, porcelain, etc.
		Beverage cans	Recycled metal
		Dry cell batteries	Recovered mercury and recycled metal
		Leftover food	Manure
Level 3 (Industrial waste + general waste + household solid waste)	Household solid waste	Raw sewage	Soil-improving agents

Fukui and Ricoh Numazu achieved level 3 zero waste in fiscal 1999. Regarding incinerated waste as being disposed, we aim at achieving perfect resource recycling.

Loss Configuration Chart to Minimize Waste Discharge

To minimize loss in production lines, the Ricoh Chemical Industry Division prepared a Loss Configuration Chart. The identification of processes where losses may occur as well as the materials that are lost improves efficiency and leads to perfect production.

Recycling Toner Waste

Ricoh Industrie France sells copier toner waste as raw materials for additives used in the foundry of steel and alloy. This effort, combined with lower processing costs, has lead to an annual savings of EU19,700 (approximately ¥2 million).

Swarf Compressor and Recovered Oil

Ricoh Elemex, which engages in metal processing for watches, gas meters, and water meters, has developed a swarf compressor. Curly swarf for reuse is compressed 1/12 in quantity for steel and 1/24 for aluminum. In addition, 50% of the cutting oil that remains on the metal is recovered for reuse. Ricoh Elemex also sells their swarf compressors as part of its environmental conservation activities.

Swarf compressor (above) and compressed swarf (right)

Recycling of Paper Used in Performance Tests

The Ricoh Elemex Ena Plant promotes the reuse of paper used in the performance tests of copiers and other equipment. Ricoh Elemex commissions neighboring welfare facilities to remove staples and pack the used paper to be reused at its plants. In this way, Ricoh Elemex eliminates the need to purchase and use new paper.

Reuse of Lens Cutting Solution

Ricoh Optical Industries, an optical equipment manufacturer, designed a machine that would allow the company to reuse the cutting solution it uses in the manufacture of glass lenses. Used cutting solution that contains abrasive materials and glass is processed in a centrifuge and filtered to be reused. A way to reuse lens cleaning solution is also being studied.

System to reuse lens cutting solution

Biological Processing of Sludge

To achieve level 3 zero waste, which includes household solid waste, it is important to improve wastewater processing facilities. Ricoh Atsugi's biological wastewater processing system for industrial and household sewage reduced 28 tons of sludge that used to be discharged monthly to zero, achieving an annual savings of ¥1.2 million.

Minimum Use of Water Resources

To wash its thermal paper production line, Ricoh Industrie France required 30m^3 of water daily in 1996. By 1998, it had cut this volume 50%, to below 15m^3. Ricoh Atsugi, Ricoh Unitechno, and Taiwan Ricoh have installed wastewater recycling systems to filter and reuse plant wastewater in their toilets, and Ricoh Yashiro has constructed a closed recycling system to achieve resource recovery of wastewater.

Database on Recycling Companies

To achieve recycling smoothly and the proper disposal of waste in the Ricoh Group, the Group has constructed a database on recycling companies that allows each Ricoh site to search for recycling companies, their contact numbers, and the type of waste handled (with certification).

Reuse of Office Supplies

Ricoh Unitechno and Ricoh Optical Industries effectively reduce cost and the use of resources by using used office supplies, consumables, laminated cardboard, and plastic bags collected at the reuse section.

Reuse section (Ricoh Optical Industries)

Zero Waste at Nonproduction Sites

Fukui Ricoh, a Ricoh Group dealer, created the Environmental Management Division in June 1999 to begin environmental conservation activities. The dealer currently sorts its waste into 32 categories, resulting in the near achievement of zero waste. The program contributed to reducing waste processing costs from ¥301,000 to ¥95,000.

Economic Benefits of Zero Waste Plants

Costs at Ricoh Numazu, which achieved zero waste in February 1999, fell ¥56.95 million[1]. The company achieved this by implementing green procurement (a campaign promoting the avoidance of purchases that may generate waste), by merging and integrating packaging methods into a system that simplifies packaging and makes use of reusable containers. Furthermore, other carefully thought-out methods were developed, including the use of liquid waste produced in the manufacturing process as cement materials. As a result, green procurement reduced costs ¥20.8 million and waste processing expenses ¥32.4 million[2]. A strict sorting program allowed some of the waste to be sold as resource, making a profit of ¥9.1 million.

1. Costs compared were for fiscal 1996, when zero waste activities began, and for fiscal 1998, when the plant almost achieved zero waste.
2. Compared with 1996 figures

◎ Five Rs Toward Zero Waste

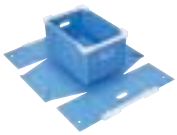
Based on the five Rs—refuse → return → reduce → reuse → recycle—the Ricoh Group is taking active steps toward realizing “perfect production=zero waste” with the cooperation of suppliers and recycling companies.

1) Refuse (Avoid buying anything that may become waste)

Minimum resource exploitation is being embraced by both the Ricoh Group end and suppliers by simplifying packaging for parts and raw materials. Many business sites are carrying out similar activities, such as buying 100% recycled toilet paper sans packaging or core.

2) Return (Return what can be returned to suppliers)

Such improvements in delivery containers as designing them to be reusable and returning them to suppliers not only use less resources but also reduce costs. Ricoh Unitechno has developed a foldable, reusable container, dubbed Fladan, which is used within the company and sold commercially.



Foldable, reusable container Fladan

3) Reduce (Reduce waste)

“Waste when mixed but resource when sorted.” The efficient sorting of waste improves the resource recovery rate and can lead to profit if sold as a resource. Several business sites have abolished the use of personal wastebaskets in an attempt to further reduce the amount of waste thrown away and to promote the recovery of resources.

4) Reuse

Reusing discarded products that had been used only once results in resource conservation and cost reduction. At Ricoh Ikeda, customers are asked to cooperate in collecting trays used in the delivery of ICs. The reuse of trays decreases the amount of plastic materials used.

5) Recycle

We are studying resource recovery methods as well as establishing a network with recycling companies. Methods of resource recovery include material recycling, which simply reuses materials without changing their form; chemical recycling, which reuses materials after processing them chemically; and thermal recycling (energy recovery), which reuses materials as fuel to generate heat energy.

Zero Waste Plants

The Ricoh Group promotes zero waste activities based on the five Rs mentioned on page 45.
The following are some ideas given by Ricoh Numazu to achieve level 3 zero waste.

Start with Entrance Checking: Do Not Buy Products that May Generate Waste.

Whatever is not used in a plant will become waste. As for packaging and containers for parts and raw materials, Ricoh Numazu examines how each of its 3,302 parts and raw materials is delivered. Ricoh Numazu works with suppliers to propose such improvements as simplified packaging, reusable containers, or the use of tankers for delivery instead of drums. Such efforts helped both

Ricoh and its suppliers reduce costs and waste.

As another example, a review of restaurant operations as part of zero waste promotion activities revealed an inordinate amount of leftover rice. To reduce this waste, the restaurant began serving rice in three sizes (large, medium, and small).

Seek and Secure at least Two Recycling Routes.

If it is impossible to substitute materials that become waste, it is necessary to recycle the waste they generate. Ricoh Numazu makes inquiries to the manufacturers of the materials regarding recycling routes. This will allow Ricoh Numazu to secure recycling routes of their own or at least gain some clues into recycling methods from the manufacturers' in-depth knowledge on the disposal of the materials they sell. We have several alternative recycling routes that are always available so that we can manage cost and be prepared for any emergency that could happen to our main recycling routes.

Use Displays to Attract New Ideas.

Setting up displays on specific examples of recycling can also be highly effective. Visibility promotes the further understanding of recycling. With it, we can identify what is being thrown away, i.e., not being recycled, and attract new ideas on solving this kind of problem. A display on sorting worked when we were targeting business site employees. The display showed how sorting is linked to recycling.

Encourage All Employees to Participate in Zero Waste Activities: The Importance of Establishing Rules that Can Be Easily Followed.

Consider the detailed sorting of wastepaper at business sites. The issue is what will the wastepaper be recycled into. Careful sorting is not required if wastepaper is to be recycled into toilet paper or laminated cardboard. It is also important not to have rules for sorting that are too exacting. It is as important for employees to set easy-to-follow rules as it is for them to observe those rules.

A box for waste that employees are unable to classify until they improve their knowledge on sorting from the person in charge of recycling

A panel with easy-to-follow directions on sorting

The Numazu Central Recycling Market in Ricoh Numazu
The mall-like sorting center contributes to expanding employee awareness of zero waste activities.