

Global promotion of the use of recycled resources 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 higher economic efficiency by finely prioritizing reuse and recycling processes. As resource depletion becomes an ever pressing issue, the development, design, procurement, production, and collection/recycling divisions at Ricoh are cooperating in such activities as “reduction in size/weight of products and a longer product lifecycle,” “enhancement of reuse and recyclability,” “promotion of closed loop material recycling,” “increasing production and sales of recycled copiers” and “reduction of packaging materials” as part of efforts to pursue effective utilization of resources and minimize the use of non-recycled, virgin resources in production. We are also striving to invent alternative materials, such as biomass resin, as a measure against the risk of resource depletion, and develop recycling process technologies with lower environmental impact.

■ Targets for Fiscal 2010

- ◎ Increase the quantity of reused parts obtained from used products to 1,910 tons by fiscal 2010. (Japan)
- ◎ Increase the quantity of reused parts obtained from used products to 6,000 tons by fiscal 2010. (Outside Japan)
- ◎ Accomplish the fiscal 2010 target quantity of recycled plastics used. (750 tons in Japan)
- ◎ Increase the quantity of resources collected from used products and recirculated (quantity of reused resources + quantity of recycled resources) to 16,000 tons by fiscal 2010. (Outside Japan)
- ◎ Commercialize biomass toners.

■ Review of Fiscal 2010

The quantity of reused parts obtained from used products was 1,876 tons in Japan (Graph ①), or an approximately 2% shortfall from the target for the fiscal year, although the quantity in question increased from the previous year. The main reason behind this was that the sales volume as of the fiscal year end fell below target due to the March earthquake and tsunami in Japan. Meanwhile, the figure for overseas sites grew to 7,672 tons, exceeding the target for fiscal 2010 (Graph ②). The quantity of recycled plastics used in Japan increased to 1,192 tons, while the quantity of resources collected from used products and recirculated overseas increased to 28,161 tons, both of which considerably exceeded the respective target quantity for the fiscal year (Graphs ③ and ④). The quantity of used toner cartridges

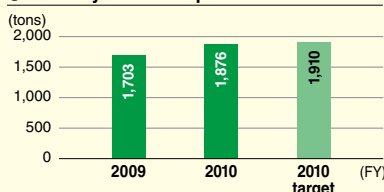
collected saw a decline in terms of weight, which is due to the weight reduction in the cartridges used in each copier (Table ⑤).

■ Future Activities

We will continue to effectively use recovered resources by increasing production and sales of recycled copiers as well as through extended use of recycled parts and materials, and thus provide our customers with products with less environmental impact and higher economic efficiency. For this purpose, it is important to improve resource recycling technologies, and increase the collection rate and collection quality of used products. By effectively utilizing collected resources while minimizing the use of virgin natural resources, Ricoh will contribute to creating a sustainable society.

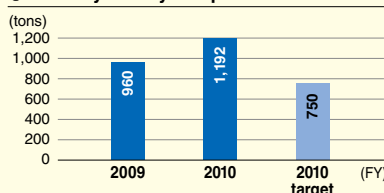
<Japan>

① Quantity of reused parts



<Japan>

③ Quantity of recycled plastics



<Global>

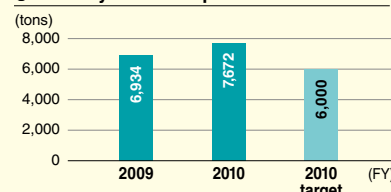
⑤ Collection results and recycling rates for copiers and toner cartridges

	Amount of used products collected			Recycling rate
	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2010
Copiers	264,899 units*	305,365 units	327,466 units*	98.9%
Toner cartridges	982.6 tons	951.8 tons	920.0 tons	99.6%

* The number of used copiers collected and the recycling rates in fiscal 2008 shown above do not include data for the Americas and those in fiscal 2010 do not include data for the Americas during the second half of the year due to a system failure there.

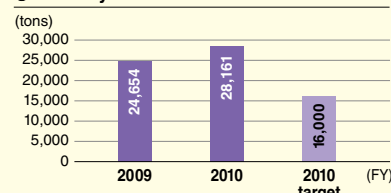
<Outside Japan>

② Quantity of reused parts



<Outside Japan>

④ Quantity of recirculated resources

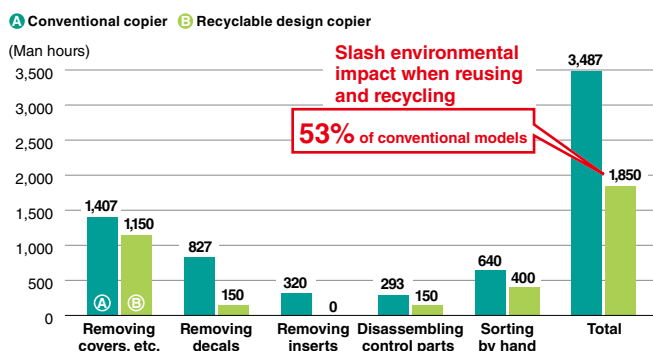


Recyclable design

<Ricoh Co., Ltd. (Japan)>

Recyclable design is an essential approach to promoting resource conservation and product recycling. To introduce recyclable design, an organization that is now known as the Recycling Technology Workshop was established in 1993. The workshop formulated the company's first recyclable design policy based on the Comet Circle, and has built up know-how in various areas, such as the grading of material, strength design considering future reuse as well as the reduction of packaging materials, the reuse of high value-added parts, recycling of high-quality materials, and improvement in the ease of disassembling and sorting. After designing copiers and printers, designers carry out recyclable design self-assessments to make necessary improvements, and in this way, the consideration of designers to recycling has already become a part of their core

Effects of recyclable design



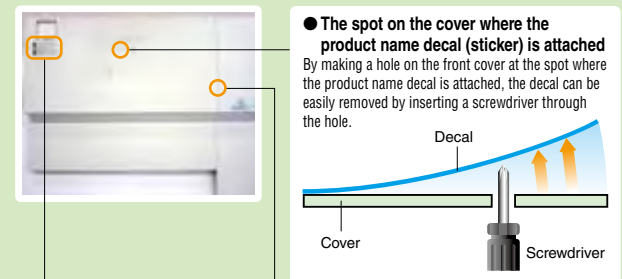
Improvement of recycling quality with recycling information system

<Ricoh Group (Japan)>

In addition to product information from the procurement of materials to sales, the Ricoh Group also controls information on each office equipment unit after sales using the recycling information system. Ricoh's recycling information system is an original traceability system designed specifically for collection and recycling purposes, whereby each unit collected is bar-coded to trace its status throughout the process. The conditions of copiers used by customers are also recorded in the monitoring database within the system. The system allows efficient production and quality improvement of recycled products due to its ability to manage on an individual unit basis, enabling identification of which collected items are currently going through which process. Used

design process. In addition, we hold a recyclable design seminar to discuss how to deal with revised rules and new laws and regulations, targeting designers of not only Ricoh's design division but also of its Group companies.

Recyclable design front cover



● Decal positioned on one part

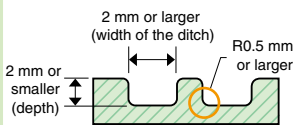
It is more difficult to dismantle the unit if the decal covers more than one part.

● Compatible decal sheet

Compatible decal sheets do not have to be removed for recycling.

● Surface of the outer cover

The surface must be designed for easy cleaning and drying for recycling. The ditch on the covering and operation surfaces must be 2 mm or larger in width and 2 mm or smaller in depth with a bottom round with R0.5 mm or larger (except for figures and letter inscriptions).



copiers are first collected by Ricoh's local sales subsidiaries/dealers or our Green Centers located in 11 cities across Japan, and sorted by model and quality level at Aggregation Centers to determine whether each collected machine will be recycled or dismantled for parts reuse or material recycling. Only products that have passed rigorous inspections are finally sent to recovery centers. At recovery centers, used products are examined again to note their condition (quality, deterioration, etc.), and then disassembled, cleaned, and washed. Data stored in the hard disc is also erased. In the assembling process, deteriorated parts and supplies are replaced with new ones. Assembled products then go through paper feeding tests, fine-tuning, and a finishing process before being shipped to ensure they meet the same standards as those for regular products. The finished recycled products are provided with the same quality warranty as that for new products.



Promotion of recycled copier business

<Ricoh Group (Global)>






Ricoh copiers are offered mainly for lease in Japan, and every leased copier is placed under our management. This system facilitates the collection of used machines, and allows us to effectively utilize resources. The know-how accumulated through this practice is also made available in countries where the business model differs from that of Japan to help develop their recycling system. However, the collection of used machines requires energy- and cost-consuming transportation, and therefore, if collected products are not effectively utilized, collection will only create substantial losses. Ricoh has adopted resource conservation and recycling as one of the pillars of its environmental conservation activities since the early 1990s, and has been working on the recycling of collected copiers, laser printers, toner cartridges, and supplies. More than 200,000 units of our used products are collected each year, and fully recycled* or

reused. Furthermore, in order to continuously promote recycling, it is also necessary to create economic value from recycling. Ricoh therefore has been engaged in recycling copiers in Japan by collecting used machines and relaunching them back into the market. Since the release of its first recycled copier in 1997, Ricoh has expanded its lineup more actively than any other company to offer a wide variety of recycled machines with a copying productivity ranging—as of fiscal 2009—from 25 to 75 pages per minute. In 2009, Ricoh also released its first recycled full-color copier, the imagio MP C3500RC/C2500RC series. With this new series launched in the market, Ricoh's recycled copiers are now capable of meeting a variety of customer needs with a wide selection of monochrome and color models.

* The recycling rate of copiers is more than 99.5%.

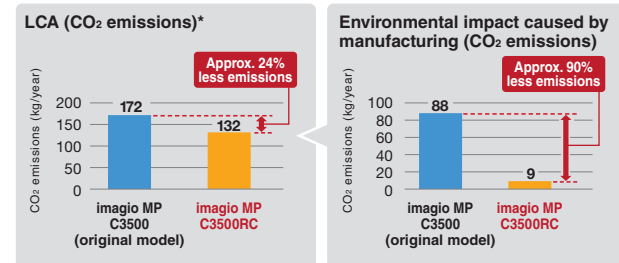
imagio RC* series, recycled multifunctional digital copiers that have achieved exceedingly high levels of eco-friendliness and quality
* RC = "reconditioned"

Color mode continuous printing speed (ppm)
Monochrome mode continuous printing speed (ppm)

 MP 7500RC m 75 MP 6000RC m 60	 Neo 453RC m 45 Neo 353RC m 35	 MP C3500RC SP c 35 m 35
 Neo 300RC m 30 Neo 250RC m 25	 MP C2500RC SP c 25 m 25	

Comparison of CO₂ emissions for the original model (copiers made with new materials) and recycled model

(As of September 2009, assessed by Ricoh)



* See page 24.

Notes:

1. The environmental impact is calculated per year over a five-year lifecycle for the original model and over a 10-year cycle for the recycled model (five years each for the original and recycled model period).
2. Figures for CO₂ emissions are rounded off to the nearest kilogram.

Recycling of highly functional components

<Office Machine Production Division, Ricoh Co., Ltd. (Japan)>

The Office Machine Production (OM) Division, a production department for Ricoh's Imaging Solution business, succeeded in reusing highly functional components of preventive maintenance (PM) units in fiscal 2010, as a result of making joint efforts with the product design and technology departments.

A PM unit is a unit to be regularly and unconditionally replaced with a new one—regardless of whether it has a problem or not. The PM unit had been recycled since 2007 but its functional components were excluded from the target of reuse because of their long operating hours and direct impact on imaging quality.

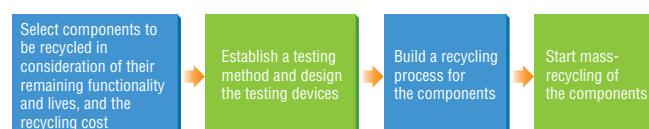
In order to make more effective use of resources and reduce waste, however, Ricoh also began recycling the functional components that met the following criteria by establishing the necessary methods and assessment technology for each of the components: (1) the functionality of recycled components must be assured; (2) the remaining life must be assessed; and (3) the recycling must provide a cost benefit.

For heating rollers (one of the functional components of a PM unit), our supplier manufactured them in China, making it difficult to recycle the used rollers in Japan. Upon a request from Ricoh, however, the supplier provided the company with detailed information, including a method to evaluate the electrical resistance of the products. The supplier also helped Ricoh procure the

necessary tools and components for the testing and recycling of the used heating rollers within Ricoh's own premises. Also, the OM Division and the product design and technology departments jointly evaluated the relationship between the remaining life of the heating rollers and the degradation of their functionality, and established a highly accurate remaining life assessment method. As a result, heating rollers can now be recycled in large amounts, which will help reduce CO₂ emissions by 5.3 tons and waste by 4.9 tons annually, while at the same time reducing costs by 18 million yen.

The Ricoh Group cooperates closely with suppliers. We will continue to conduct activities to increase the number of highly functional components that can be recycled and reused in close cooperation with our business partners and suppliers.

Flow to assure the quality of recycled components



Promoting “resource-recirculating eco packaging” <Ricoh Group (Japan)>

Ricoh has long been working to reduce the use of packaging materials. In 1994, we started “eco packaging” which uses less cardboard. In 2001, we introduced further advanced “resource-recirculating eco packaging” materials to the market. As of fiscal 2010, about 70% of our copiers—or 48 models out of a total of 68—shipped within Japan have been packaged in these resin-based materials that can be used repeatedly. In addition, we offer the option of delivering products simply wrapped in damage-protection film direct from the factory to customers. This simple film packaging is employed mainly to wrap some models of high-speed copiers, for which packaging can be reduced by more than 100 kg per unit. We are working to expand the use of this packaging method to wider areas.

Through these efforts, we have reduced consumption of packaging materials by some 1,280 tons this fiscal year, equivalent to about 1,680 tons of CO₂ emissions.

* For more details, please refer to the related web page:
http://www.ricoh.com/environment/product/resource/03_01.html



Resource-recirculating eco packaging

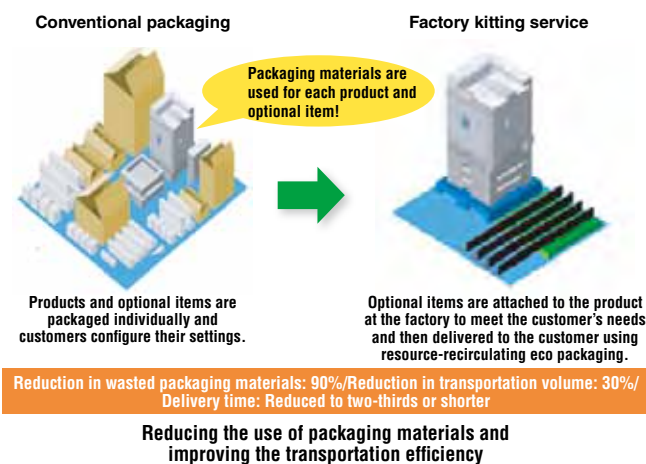
Factory kitting service using resource-recirculating eco packaging

<Ricoh Co., Ltd. (Japan)>

Ricoh provides customers with a factory kitting service. Specifically, for the product to be delivered to a customer, the company attaches optional items and configures the necessary settings, including IP addresses, according to the specifications of the customer. Ricoh then directly delivers the product and all other items packed as one unit to the customer. This service helps shorten the installation time of the machine, and also contributes to a substantial reduction of packaging materials compared with the traditional delivery of items separately packaged in cardboard.

Moreover, the factory kitting service contributes to substantially improving the efficiency of logistics operations through direct delivery from the factory to the customer, and also increasing the transportation efficiency by reducing the overall shipping volume.

Conventional packaging versus the factory kitting service



Resource Conservation

“Level Color” printing developed to substantially reduce the use of ink without compromising legibility

<Ricoh Co., Ltd. (Japan)>

Ricoh's GELJET printer employs GELJET technology for high-quality, high-speed and high-color printing on plain paper, a requirement at offices. In 2004, the company independently developed “Level Color” printing technology to reduce the use of ink for images (photos, illustrations, graphs, etc.) without changing the amount of ink used for text, thereby making it possible to output color prints using an amount of ink equivalent to that used for monochrome printing. Subsequently, the technology was further advanced to make color printing more economical while maintaining the legibility of text and images. Specifically, utilizing the fact that the sensitivity of the human eye to colors varies depending on the color, the amount of ink for colors whose legibility does not depend on the color strength is reduced. This advanced “Level Color” printing technology was first applied to the IPSiO GX e3300 released in May 2009 and then also applied to the subsequently released IPSiO GX e2600, IPSiO GX e5500, and IPSiO GX e7700.

These models are also equipped with a newly developed ink feeding system*, which has greatly improved ink cartridge use efficiency. Ricoh will continue to develop product technologies and help customers reduce their environmental impacts.

* For more details, please refer to the related web page:
http://www.ricoh.com/environment/technologies/products/02_01.html

Amount of ink used to print a document including a photo (Example)

