

Global Promotion of 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 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 by increasing sales of recycled products such as recycled copiers and by establishing an efficient recycling system. [* See page 18.](#)

■ Targets for Fiscal 2007

- ◎ Improve the quantity of reusable parts used by a factor of at least five (compared to fiscal 2003 figures in Japan).
- ◎ Increase the quantity of recycled plastics used to 1,000 tons or more.
- ◎ Increase the number of recycled copiers marketed by a factor of at least 10 (compared to fiscal 2003 figures in Japan).

■ Review of Fiscal 2007

Compared to fiscal 2003, the quantity of reusable parts used increased five times and the quantity of recycled plastics used per year amounted to 1,346 tons, which indicates that we successfully reached our fiscal 2007 targets. The sales of recycled copiers in Japan increased 7.9 times, which means that although we missed our fiscal 2007 target, the number of reused units increased substantially. Through these activities, Ricoh is increasing the use of recovered resources globally and the amount is increasing steadily every year. We are also actively engaged in collecting used copiers and toner cartridges. As a result, the number of used copiers collected is increasing steadily. The number of used toner cartridges collected saw a decline due to the decrease in the sales of applicable products in certain territories.

■ Future Activities

We will continue to effectively use recovered resources by increasing the production and sales of recycled copiers as well as the use of recycled parts and materials, and thus provide our customers with products with less environmental impact and with higher economic efficiency. For this purpose, it is important to improve the collection rate and collection quality of used products. Through these activities, Ricoh will move forward with the utilization of recovered resources to contribute to creating a sustainable society.

Segment Environmental Accounting of the Product Recycling Business (Japan)

Costs		Effects		
		Economic benefits		Effect on environmental conservation
Items	Costs	Items	Benefits	
Product recycling cost	¥732 million	Sales	¥11,977 million	Amount of resource recovery: 28,669 tons Down 2,761 tons from that in the previous year
Collection/resource recovery cost	¥2,545 million	Social effect	¥2,294 million	
Total cost	¥3,277 million			

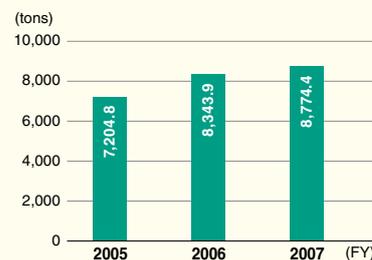
* Social effect refers to the cost of waste disposal that customers no longer have to pay.

<Global>

① Collection results and recycling rates for copiers and toner cartridges

	Amount of used products collected			Recycling rate
	Fiscal 2005	Fiscal 2006	Fiscal 2007	Fiscal 2007
Copiers	287,268 units	307,047 units	319,643 units	98.5%
Toner cartridges	1,388 tons	1,023 tons	993.5 tons	98.9%

② Changes in amount of recovered resources used



* Data for the previous years were corrected as shown in the graph.

Practicing Recycling with Less Environmental Impact

The Ricoh Group clearly prioritizes recycling methods to promote its recycling activities. Recycling collected products into commercially useful products generates less environmental impact and creates greater associated economic benefits than

if they were disassembled and sorted to be recycled into resources/energy. This idea is represented in the Comet Circle*. The flow of the recycling process, from the recovery of copiers collected from the market to the launch of recycled copiers, is shown in the second innermost loop. The recycled copier business contributes to the creation of a

sustainable society. In addition to focusing on this business, we are striving to reduce the level of resource consumption for new products in the development phase, and thus are reusing and recycling materials, water resources, manufacturing supplies, and many others in the course of each production process. [* See page 18.](#)

Putting the Recycling Business in the Black

<Ricoh Group (Japan)>

Resource conservation and recycling constitute one of the pillars of the Ricoh Group's environmental conservation activities. Since the early 1990s, we have been recycling our products, such as copiers and laser printers. More than 200,000 units of our used products are collected each year, all of which are fully recovered¹ or reused to make other recycled products. In order to continuously promote recycling, it is necessary to create



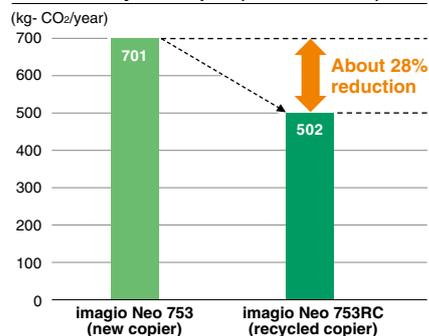
imagio Neo 753RC/603RC released in February 2008

economic value from recycling. Thus, Ricoh has been engaged in recycling copiers by collecting used machines from the market and putting them back on the market again. However, we had to deal with various problems before we could get our recycling business on track. Production plans for recycled products depend on the amount and quality of used machines collected from the market, and recycled copiers are the previous generation's products—thus they are functionally inferior to the current machines. Having overcome these obstacles one by one, we achieved sales of recycled copiers exceeding 10,000 units in fiscal 2006, and we achieved a profit for the first time since we commenced the recycling business in 1998. At present, we offer a wide variety of recycled machines with a copying productivity ranging from 35 pages/min. to 75 pages/min. Taking the imagio Neo 753RC as an example, an average of 88% (mass ratio) of the parts used are recycled parts, and its

environmental impacts over its whole life-cycle and during its manufacturing process are reduced by about 28% and about 94%, respectively, compared with those of the previous model.²

1. Recycling rate of 99.5% or more
2. Comparison between imagio Neo 753RC and imagio Neo 753 (new copier)

① LCA Comparison Between a New Machine and a Recycled Copier (CO₂ Emissions)



* A comparison is made by calculating the annual environmental impact of new and recycled copiers over a 5-year period and 10-year period (i.e., 5 years for new copiers and another 5 years for recycled ones), respectively.
 * Figures for CO₂ emissions by copiers in operation at customer sites were not included in the calculation of the data.

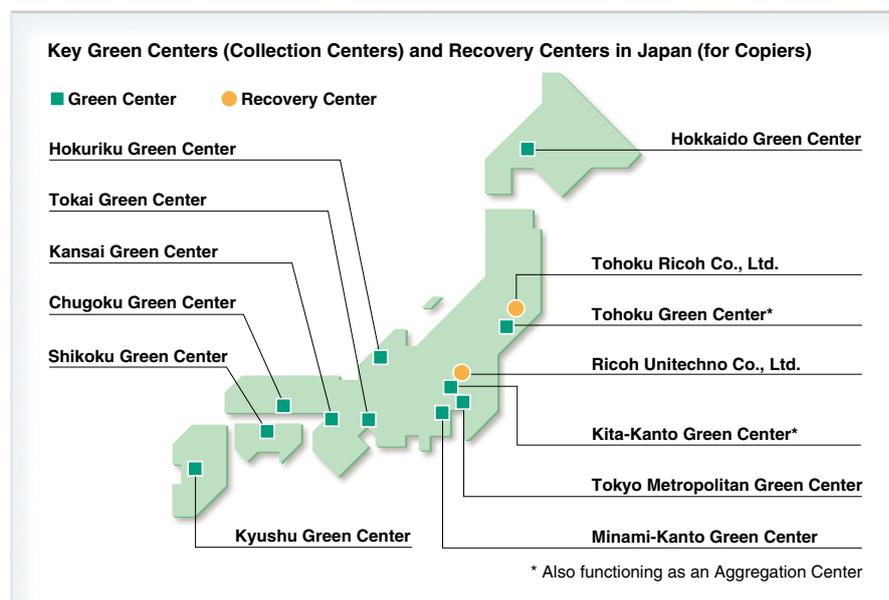
Improving the Efficiency of Used Product Collection

<Ricoh Group (Japan)>

Used copiers are first collected by Ricoh's local sales subsidiaries/dealers or our Green Centers located in 11 cities across Japan, where collected products are inspected and sorted. Specifically, serial number, the number of sheets copied, damage, conditions of power cables and paper feeders, etc., are checked to determine whether the collected products are recoverable enough to become recycled products. Collected products identified as being in good condition are then sent to regional Aggregation Centers, where further examinations are conducted, including the inspection of various functions such as power supply, panel display, and paper input and output. If necessary, simple repairs are also done there. Only those that have passed such a rigorous twofold inspection are finally sent to recovery centers. These processes underpin the high recovery efficiency of our used products. Furthermore, our original "Collection Forecast System," developed in

September 2004, allows us to project the number of units to be collected accurately, and thus to develop detailed production and

marketing plans and expand our recycled copier business substantially.



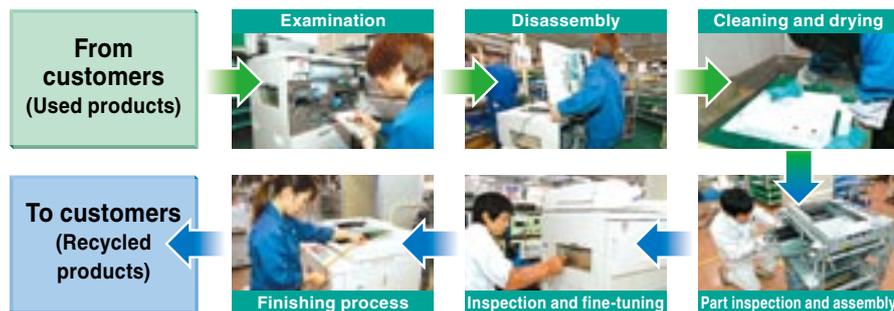
Quality Control and Efficiency Improvement in the Course of Production Processes for Recycled Products

<Ricoh Group (Japan)>

Our recycled products are manufactured in accordance with the same quality standards as our regular products. At recovery centers, used products are examined again to note the conditions (quality, deterioration, etc.) of each part, and they are then disassembled, cleaned, and washed. Data stored in the disk drives undergoes complete erasure at that time. In the assembling process, deteriorated parts and supplies are replaced with new ones. Then, assembled products, just as regular products, go through paper feeding tests, fine-tuning,

and a finishing process. Finally, the finished recycled products go to the market with the same quality warranty as our regular products. These recycling flows are managed under Ricoh's original "recycling information system," whereby each unit collected is bar-coded to trace its status throughout the process. The system allows efficient production of recycled products because its ability of unit-by-unit management enables identification of which collected items are currently going through which process.

Recycling process for copiers



Promoting Used Toner Cartridge Collection through the Internet

<Ricoh Group (Europe)>

The E Return Web System started to operate in October 2007 in Germany to promote the collection of used toner cartridges throughout Germany. The system accepts customers' requests on the Internet and arranges a pickup by DHL's home delivery service. Previously, used toner cartridges were returned through post offices. With this system, customers do not have to go to a post office. Collected toner cartridges are transported to the National Green Center in Germany for recycling, and reusable cartridges are sent to production sites in the U.K. and France. Building on this successful operation in Germany, the Ricoh Group will introduce the system and establish green centers in other countries.

Promoting Eco Packaging

<Ricoh Group (Japan)>

Ricoh has long been working to reduce the use of packaging materials. In 1994, we started "eco packaging" with less use of cardboard. In 2001, we introduced further advanced "resource-recirculating eco packaging" materials in the market. These resin-based packaging materials can be used repeatedly. As of fiscal 2007, about 70% of our copiers shipped from Japanese factories were packaged with these resource-recirculating eco materials. In addition, we are engaged in activities in which we deliver the product simply wrapped in damage-protection film only to the customers straight from the factory. Through these efforts, we are saving the consumption of packaging materials by some 8,400 tons, equivalent to about 11,000 tons of CO₂ emissions.

Collection of Used Products and Sales of Recycled Copiers in the Asian Market

<Ricoh (Thailand) Ltd. (Thailand)>

Ricoh (Thailand) Ltd., a sales subsidiary in Thailand, implemented its full-fledged copier recycling business in fiscal 2003, in response to market demand for high-quality recycled copiers. Roughly half of all recovered copiers are recycled and sold, thanks to an improved collection infrastructure and recycling technologies.



Manufacturing recycled copiers at Ricoh (Thailand) Ltd.



Resource-recirculating eco packaging