

## 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 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 2009

The quantity of reused parts obtained from used products was 1,703 tons in Japan (Graph ①), down from the level of the previous fiscal year, which is attributable to an overall decline in sales due to the economic downturn continuing from 2008. Meanwhile, the figure for overseas sites grew to 6,934 tons, exceeding the target for fiscal 2010 (Graph ②). The quantity of recycled plastics used in Japan increased to 960 tons, while the quantity of resources collected from used products and recirculated overseas increased to 24,712 tons, both of which considerably exceeded the respective target quantity for fiscal 2010 (Graphs ③ and ④). The quantity of used toner cartridges collected saw a decline in terms of weight in spite of an increase in the number of collected copiers, which is due to the weight reduction in the cartridges used in each copier (Table ⑤). Another feature of

resource-conservation effort made in this period was the November 2009 release of the imagio MP 6001GP, a multifunctional digital copier that uses biomass toner.

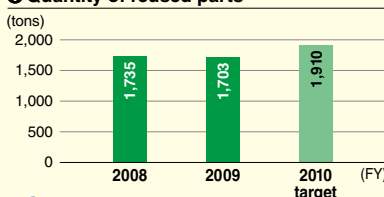
See page 23.

### ■ 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.

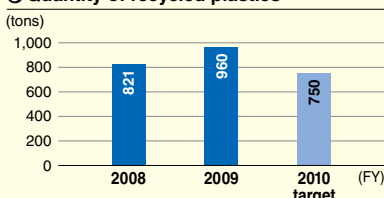
#### <Japan>

① Quantity of reused parts



#### <Japan>

③ Quantity of recycled plastics



#### <Global>

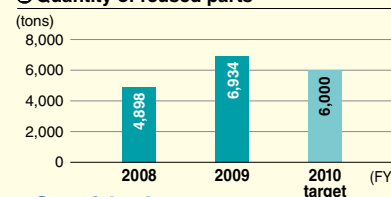
⑤ Collection results and recycling rates for copiers and toner cartridges

	Amount of used products collected			Recycling rate
	Fiscal 2007	Fiscal 2008	Fiscal 2009	Fiscal 2009
Copiers	319,643 units	264,899 units*	305,365 units	98.6%
Toner cartridges	993.5 tons	982.6 tons	951.8 tons	99.5%

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

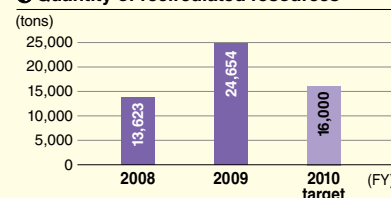
#### <Outside Japan>

② Quantity of reused parts



#### <Outside Japan>

④ Quantity of recirculated resources

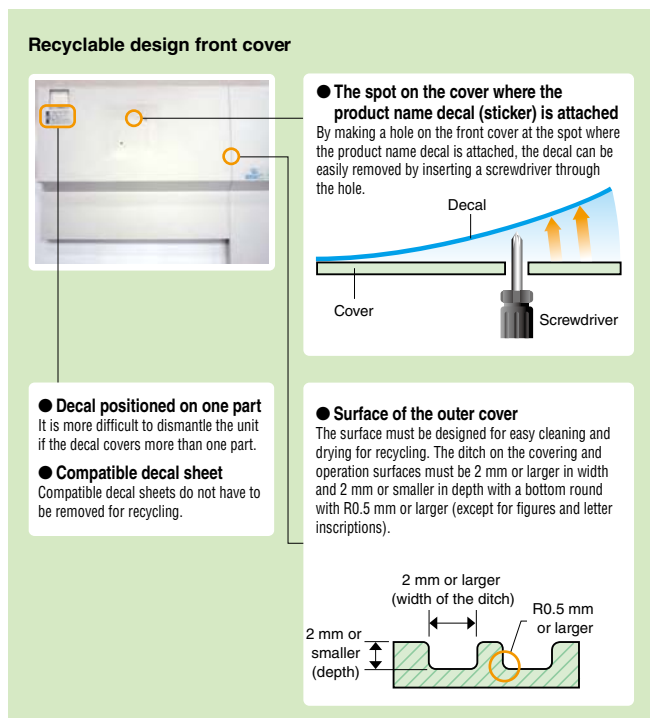
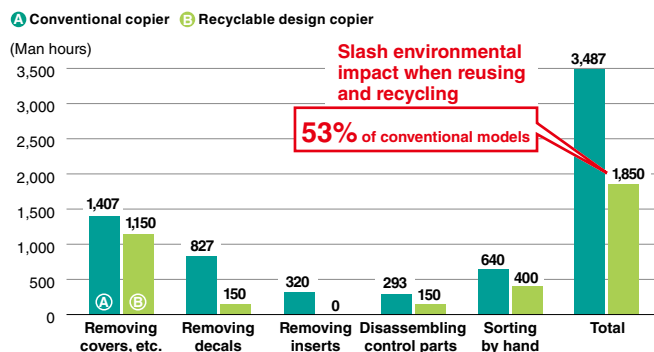


## Recyclable design

### <Ricoh (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 grading of material, strength design considering future reuse as well as the reduction of packaging materials, 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 design process. In addition, we hold a recyclable design seminar twice a year to discuss how to deal with revised rules and new laws and regulations. The participants include designers of not only Ricoh's design division but also of its Group companies, and in fiscal 2009, seminars were held in February and August, attracting about 60 attendees in total.

#### Effects of recyclable design



## Providing free access to patents in order to boost the efficiency of home appliance recycling

### <Ricoh (Japan)>

As part of its measures to manufacture recyclable design products, Ricoh developed compatible labels which do not compromise the quality and purity of recycled plastics even when parts are dissolved and reused with the labels still on. We have been using these labels as decal sheets for products such as multifunction copiers and printers, as well as fax machines, since 1994.

In order to promote the use of compatible labels for other home appliances, Ricoh signed a contract with the Association for Electronic Home Appliances in October 2009 to allow the association and its member firms free access to the relevant patents Ricoh owns. By having these compatible labels used in many home appliances, and by displaying the materials used in the labels, home appliance recycling plants can now eliminate the conventional process of removing product labels manually or punching them out by machine. This boosts the efficiency of the recycling process, and enables the recycling of high-quality materials. Ricoh expects that highly efficient plastic recycling using these the compatible labels will take root in Japan, and will contribute to the building of a recirculating society.



## Reducing waste-processing time and cost by using compatible labels

The deployment of compatible labels has enabled us to eliminate the roughly 14-minute process of removing labels when recycling copiers (in the case of widely used models) and the need to separately dispose of the labels, thereby boosting work efficiency at the recycling stage and reducing processing costs. Due to these efforts, we first introduced products equipped with parts composed of more than 20% recycled plastic content in 1999. Building upon this achievement, we have since continued increasing the use of recycled plastics.

## 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 of 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 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.



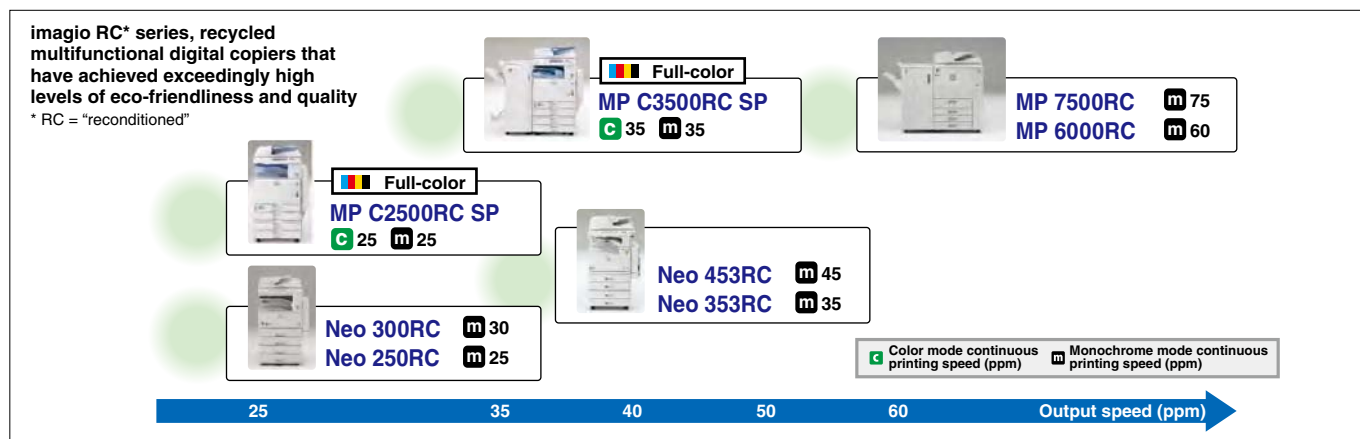
## Promotion of recycled copier business

### <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 from the market 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/G2500RC 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%.



## Release of recycled digital full-color copiers, imagio MP C3500RC/C2500RC series

### <Ricoh (Japan)>

In September 2009, Ricoh released the imagio MP C3500RC/C2500RC series, Ricoh's first recycled digital full-color copiers. The average rate of used parts in the production of the series stands at 80% in weight, and we have reduced CO<sub>2</sub> emissions during manufacturing by roughly 93% from the original model (produced as new units). The CO<sub>2</sub> emissions reduction over the

total lifecycle of imagio MP C3500RC and imagio MP C2500RC is estimated to be roughly 27% and 20%\*, respectively.

\* The environmental impact was calculated per year over a five-year lifecycle (original model); the lifecycle was 10 years for the recycled model (five years each for the original and recycled models).



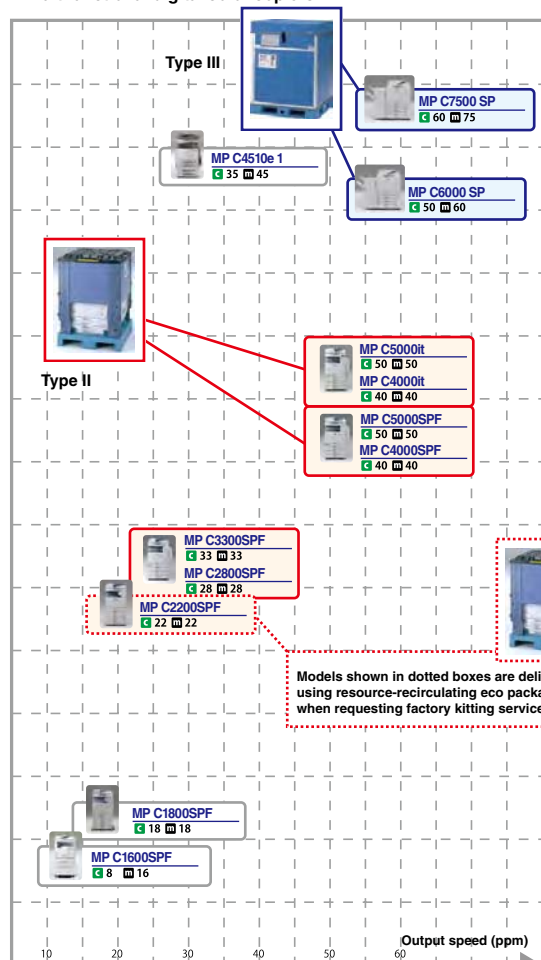
imagio MP C3500RC

## Promoting "resource-recirculating eco packaging" <Ricoh Group (Japan)>

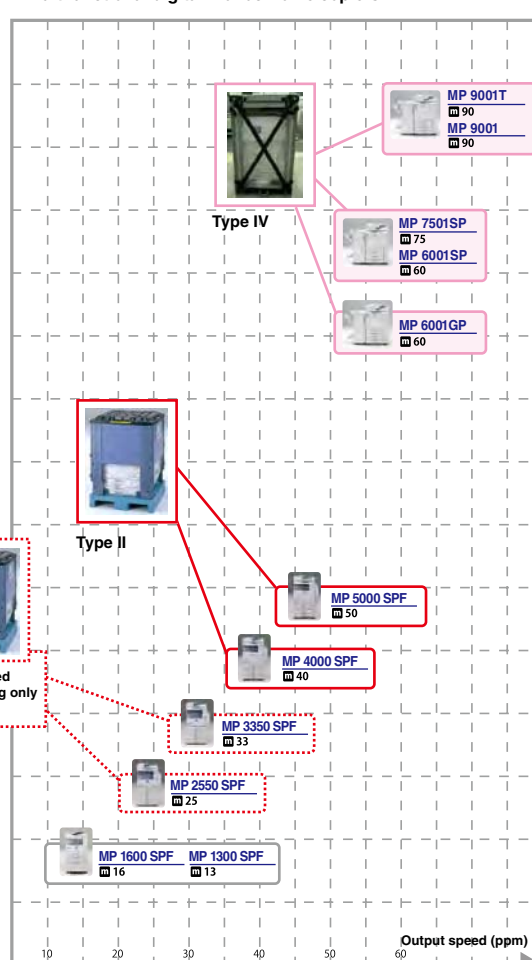
Ricoh has long been working to reduce the use of packaging materials. In 1994, we started "eco packaging" which uses less cardboard. In 2001, we introduced further advanced "resource-recirculating eco packaging" materials to the market. As of fiscal 2009, about 60% of our copiers—or 46 models out of a total of 60—shipped within Japan have been packaged in these resin-based materials that can be used repeatedly. In addition, we are engaged in activities in which we deliver products simply wrapped in damage-protection film direct from the factory to customers. Through these efforts, we are reducing consumption of packaging materials by some 990 tons each year, equivalent to about 1,300 tons of CO<sub>2</sub> emissions. From fiscal 2009, resource-recirculating eco packaging has been used not only for copiers but also for related peripheral (optional) equipment. An example is finishers produced by Ricoh Elemex Corporation, for which packaging materials previously used for earlier models are reemployed.

### List of products shipped with resource-recirculating eco packaging

#### ■ Multifunctional digital color copiers



#### ■ Multifunctional digital monochrome copiers

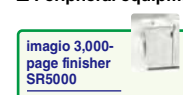


#### ■ Backbone printing



Type V

#### ■ Peripheral equipment



Type I

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

Models shown in this box are not currently available in resource-recirculating eco packaging.