

We are making every effort to reduce discharged matter and alleviate the waste of resources at our global sites.

■ Concept

The Ricoh Group is working globally to maximize resource productivity, primarily by limiting the amount of matter generated that will be discharged, reducing water consumption, and reducing paper consumption. Since fiscal 2008, new reduction efforts have been promoted. These focus on resource waste reduction in the thermal media business, the packaging materials used in production, and transportation between sites inside and outside of Japan, as well as the discharged matter generated during the production of polymerized toners. In addition, we introduced an audit system for waste disposal service providers in Japan to upgrade and expand appropriate waste disposal methods. To enhance this system, in October 2009 we began a scheme to recognize excellent service providers.

■ Targets for Fiscal 2010

- ◎ Reduce the amount of discharged matter in the thermal media business by 10% from the level in fiscal 2006.
- ◎ Reduce the amount of discharged matter from packaging materials by production volume in the manufacture of imaging systems by 30% from fiscal 2006 levels inside Japan, and from 2007 levels outside Japan.
- ◎ Reduce the amount of discharged matter per production volume in production of polymerized toners by 17% from the level in fiscal 2007.

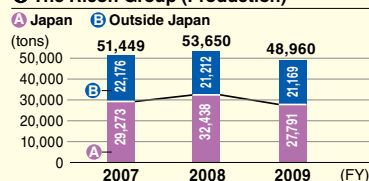
■ Review of Fiscal 2009

In fiscal 2009, the Group's total amount of discharged matter

decreased by 8.7% compared to the previous fiscal year (Graph ①), indicating that improvements have been steadily made in the three priority areas. Discharged matter in the thermal media business was reduced by 5.7% over fiscal 2006. To reduce packaging materials used in production and for transportation between sites inside and outside of Japan, individual sites are striving to achieve the targets set for fiscal 2010. In the area of discharged matter generated during the production of polymerized toners, reduction per production volume reached 23.3% compared to the fiscal 2007 level.

<The Entire Ricoh Group>

Total amount of discharged matter generated
① The Ricoh Group (Production)

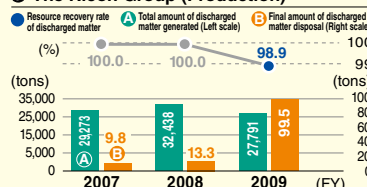


* As for sludge, the volume after drying is considered as its volume.

<Japan>

Resource recovery rate of discharged matter/Total amount of discharged matter generated/Final amount of discharged matter disposal

② The Ricoh Group (Production)



Resource recovery rate of discharged matter:

Amount of resource recovered/amount discharged

Amount of water removed by dehydration, drying, or deacidification is excluded from the calculation for the fiscal 2009 rate.

* Graphs ① to ④, above, include data for Ricoh's non-production sites.

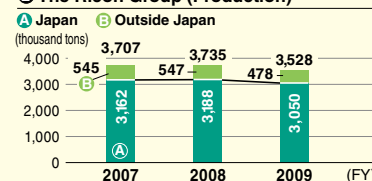
* Residue left after intermediate treatment is included in the calculation of the amount of resources recovered and final disposal amount for fiscal 2009 (Graphs ② and ④). Amount of residue from refuse incineration is included in the final disposal amount, even if energy is recovered from the incineration process. Increases in the final amount of discharged matter disposal in Japan in fiscal 2009 is attributable to this change in the calculation basis.

■ Future Activities

We need to step up improvement efforts to meet the targets set for fiscal 2010, which falls on the final year of our 16th Environmental Action Plan. As for discharged matter in the thermal media business and polymerized toner production, the production, development, and design divisions will co-operatively select improvement themes and continue to make efforts to reduce wastage of resources. As for packaging materials used in production, steady efforts will be made to implement the measures introduced.

Volume of industrial water used

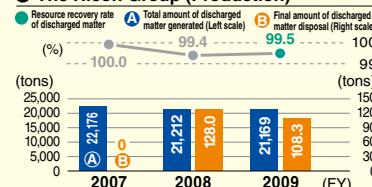
③ The Ricoh Group (Production)



<Outside Japan>

Resource recovery rate of discharged matter/Total amount of discharged matter generated/Final amount of discharged matter disposal

④ The Ricoh Group (Production)



* Final amount of discharged matter disposal in fiscal 2008

consists of sludge in the private sewerage systems of Shanghai Ricoh Digital Equipment Co., Ltd., used in landfills, and part of the sludge used in landfills as a result of Ricoh Thermal Media (Wuxi) Co., Ltd. coming on line.

Auditing waste disposal service providers

<Ricoh (Japan)>

Ricoh has been making efforts to enhance the audit of waste disposal service providers since 2005 so that waste generated by the company will be disposed of properly and appropriately by reliable partners. We established uniform audit standards for the Ricoh Group, conducted auditor training for employees engaged in waste disposal at respective business sites, and certified them as auditors. Ricoh currently audits all the service providers that have business relations with the Group's production sites. In the event that any non-compliance is detected, the service provider is requested to make improvements, and provided with assistance to carry them out. After a few days, a confirmation audit is conducted. In fiscal 2009, we revised our standards for service arrangements with waste disposal

providers based on our audit standards. The revised standards have now been incorporated into the Ricoh Group Standards, a set of internal standards for entering new or renewing existing contracts with business partners. In addition, a Certification Program for Excellent Waste Disposal Service Providers has started, and we recognized the first certified vendor under this program in February 2010. As the next step, we are working to ensure that waste generated from our sites will be disposed of by a smaller number of excellent waste management partners in order to better manage the risks associated with illegal waste disposal. At the same time, we will also work more closely with our waste management partners so that they all will be able to meet the quality requirements for certified waste disposal service providers.

TOPIC

Certifying Excellent Waste Disposal Service Providers

Matsuda Sangyo becomes the first certified provider.

On February 10, 2010, Ricoh presented a certificate to Matsuda Sangyo Co., Ltd. (Sayama Plant, Environmental Division; and Musashi and Iruma Factories, Product Division) at the Matsuda Sangyo headquarters in Shinjuku, Tokyo to recognize the company as the first Excellent Waste Disposal Service Provider for the Ricoh Group. Matsuda Sangyo operates food, precious metal, and environment businesses.

Its Environmental Division has a nationwide network for material recovery that takes advantage of the company's proprietary high-quality technologies in the fields of precious material recycling for the recovery of silver from used photosensitive materials and waste liquid processing. The company has been working hard to build a sustainable society through its corporate philosophy aimed at reducing the environmental impact and the effective use of non-recyclable resources.

Mr. Tsuneo Tokunaga, Senior Managing Director Product Division said, "We are honored to become a certified partner of an environmental leader like Ricoh. I believe that our constant commitment to the motto, 'All our businesses must be of benefit to customers' has led to our certification." Mr. Ryuichi Yamazaki, Director Environmental Affairs Division, also said, "We are pleased with this recognition of our uncompromising efforts to meet the increasingly severe regulatory requirements of this decade. We are also grateful to Ricoh for the objective advice we received during the audit of our start-up Sayama Plant. Their input was really helpful."

"Matsuda Sangyo is a reliable and diligent partner. I saw its staff members perusing Ricoh's detailed documents in a waiting room before they picked up recyclable materials from our plant. They often provide us with specialized knowledge and the latest information. Through my day-to-day interaction with them, I can tell that the company takes pride in what they do. Strong and reliable partners like Matsuda Sangyo make the valuable activities of recourse recycling by manufacturers like Ricoh possible," said Tomoko Yuuki, auditor at the Ricoh



Matsuda Sangyo's Senior Managing Director Tsuneo Tokunaga (center) and Director Ryuichi Yamazaki (center right) holding the certificate. Presenters of the certificate: Ricoh's General Manager of Corporate Environment Division Tatsuo Tani (center left) and Auditor Tomoko Yuuki (far left)

Atsugi Plant, who recommended Matsuda Sangyo to be the first certified vendor.



R&D Center (top) and Sayama Plant (bottom) at Matsuda Sangyo

Full use of a Production Loss Tree to achieve enhanced quality, reduced costs, shorter delivery time, and greater environmental friendliness**<Ricoh Thermal Media Company (Global)>**

Ricoh Thermal Media Company (TMCo) aims to eliminate resource waste from its operations by using the "Production Loss Tree" chart. Previously, improvement activities were conducted individually in line with the areas of concern: quality, costs, delivery, and environment. The chart, which was introduced in 2006, visibly demonstrates how much of a resource is wasted at which point of the production process on a factor-by-factor basis. In the chart compilation system, the information about a single type of waste is registered with the information about its causal factors, financial value, and resulting discharge as a focal area of improvement activity so that TMCo can simultaneously assess the potential of different activities to reduce the amount of discharged matter, improve quality and cut costs. The company can then determine the level of importance of difficult or process design-related issues otherwise unaddressed. Problematic yet uncared-for preconditions and bottlenecks are revisited to determine if they have been corrected and to ascertain possible benefits if corrected. Based on the reevaluation, such problems previously uncared for because the manufacturing function alone was unable to overcome them are now subject to joint improvement activities with other departments. In this way, the overall quality of the improvement activities has been enhanced. Since fiscal 2008, the company has rolled out the activities in its four production regions (France, the U.S., China, and Japan) and been operating a "Cost Reduction and Environmental Information Database" and other information disclosure tools to share the progress of the activities and related challenges in each region, in order to help achieve business and environmental goals on a global scale. Such a sustainable environmental management approach that considers environmental impacts as part of business costs and aims for even higher quality has penetrated Ricoh's thermal media facilities around the world.

Wastage reduction efforts by identifying the causes of paper out**<Ricoh Thermal Media Company, Ricoh Industrie France S.A.S. (Global)>**

Thermal paper products, the flagship products of Ricoh Thermal Media Company, are manufactured by applying layers of chemicals that generate color when exposed to heat. These manufacturing processes involving repetitive coating and drying of chemicals require long production lines—100 meters long (base paper travels 370 meters)—and are equipped with more than 200 paper conveying rollers. A single occurrence of paper out in the production lines entails a massive amount of waste chemicals and base paper, as well as time and labor for cleanup and recovery. To minimize the occurrence of paper out, Ricoh Industrie France S.A.S. (RIF) identified its major causes in fiscal 2009 based on analysis of the Production Loss Tree and took rectifying measures such as: (1) optimizing the timing of paper refilling by assessing the causes of defective refilling identified by high-speed cameras installed at automatic refilling points, and (2) introducing crease-prevention measures to winders. The corrective activities have led to the reduction of paper-out conditions by some two-thirds and an annual waste



Automatic refilling process to transfer a 200-cm-wide roll paper to another rolling conveyor. The optimized operational timing prevents paper out caused by failed refilling.

discharge reduction of 450 tons year-on-year. The key to such success was in-depth analysis and action. Higher yield rates, lower costs, and greater operational efficiency have also been achieved by these improvement efforts. In fiscal 2010, RIF started to monitor and analyze the determining factors of wastewater levels, in order to reduce wastewater discharge, which accounts for a large portion of the company's total waste.

Closed-loop recycling of solvents used for producing PxP toners (polymerized toners)**<Ricoh RS Division (Ricoh Numazu Plant) (Japan)>**

At Ricoh RS Division, recycling of the solvents used in manufacturing PxP toner, which was previously outsourced to external contract vendors, is now done on site. To achieve this level of onsite closed-loop recycling, the division worked to identify a toner material formula and manufacturing technologies that were more recycling-friendly. It was a challenge because the solvent used influences the shape of the toner particles, an important determinant of the quality of PxP toner, and conventional solvents, which are made from several different chemicals, are difficult to recycle. After intensive research, Ricoh's RS Division successfully developed a new technology that retains high-quality particle shapes, even when the solvent used during the manufacturing process is changed from the conventional mixed type to a single chemical solvent. The new technology has enabled us to avoid operational losses related to the washing of the production equipment that is required before manufacturing a different toner model. The recycling made possible by this technology has resulted in reduction in discharged matter as well as an approx. 90% reduction in solvent consumption and the associated cost reduction. To leverage this success, Tohoku Ricoh Co., Ltd. has decided to adopt this new technology at its new mass production facility for PxP toner that is scheduled to start operation in 2010. The company is also going to establish a higher resource-productive manufacturing system.

Reducing packaging waste in transportation between global production sites**<Ricoh Group (Global)>**

All the parts and units transported from Ricoh Asia Industry (Shenzhen) Ltd. (RAI) to production sites throughout the world used to be placed in corrugated cardboard boxes, which were then carried in containers. Waste materials are recycled by the business sites accepting the goods as corrugated cardboard, but recycling does cause some environmental impact and wastage of resources, which ultimately made it necessary to reduce used packaging materials. In light of this, returnable racks that can be used repetitively were introduced in fiscal 2007 for the transportation of some parts including scanner units from RAI to the Ricoh Gotemba Plant. In fiscal 2008, such racks were introduced for the transportation of ADF units from Ricoh Elemex Corporation (Shenzhen) to the Ricoh Gotemba Plant. From fiscal 2009, use of this green packaging has been expanded globally, including for the transportation of items from RAI to Ricoh Industrie France S.A.S. (RIF). We have also worked to improve the load-carrying efficiency, which has led to the simultaneous realization of an annual reduction of packaging material waste by an amount of about 500 tons and an annual ¥45-million cost decrease.



Transportation by returnable rack