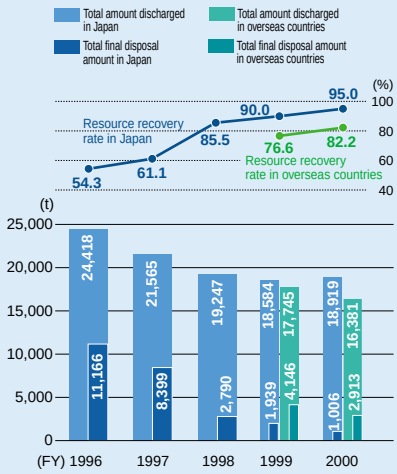
Production (Zero Waste to Landfill)

Most waste generated at plants is excessive raw materials (i.e., resources) that were left over from the manufacturing process. If production sites would use only the amount of raw materials needed to make their target number of products without any left over material, waste would be minimized and there would be no loss in materials, energy, or personnel expenses.

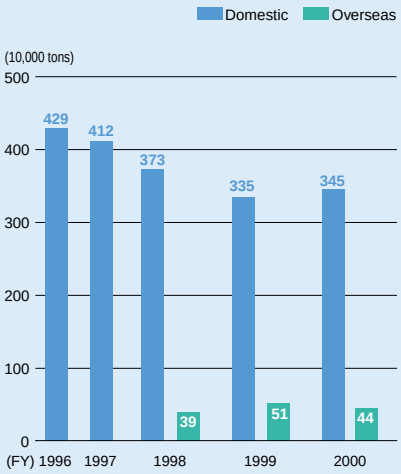
The Ricoh Group's comprehensive "entrance management" at plants for material procurement is based on the idea that waste should be prevented instead of recycled. The Group pays close attention to ways in which it can reduce the environmental impact of the packaging it uses for its finished products while conducting internal management to improve the productivity of its production lines.

In fiscal 2000, the Ricoh Group achieved zero waste at all 16 of its production sites in Japan as well as at all production sites in France, the United States, and Mexico as a result of its global efforts. The Group is expected to achieve zero waste in the U.K. in autumn 2001. As for nonproduction sites, the Aoyama Office and Fukui Ricoh, a sales company, also achieved zero waste. All sites that achieved zero waste not only reduced their costs but also succeeded in improving their management systems. In this way, the Ricoh Group promotes zero waste worldwide, reducing the amount of resources needed and setting a Groupwide goal of achieving more efficient recycling.

Resource Recovery Rate/Total Amount of Waste Discharged/ Amount of Waste Finally Disposed by the Ricoh Group



Volume of Industrial Water Used by the Ricoh Group



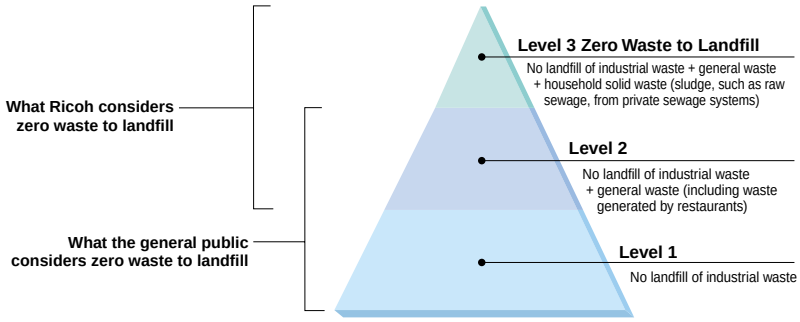
Resource recovery rate: Amount of resources recovered/amount of resources discharged
Amount of waste discharged: Amount of waste discharged from business sites (including residue after onsite processing)
Amount of waste finally disposed: Amount of waste used in landfills and incinerated out of the total amount of waste discharged

Zero Waste to Landfill 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). In case waste is simply incinerated without utilizing as energy resources, we regard such incineration as just disposal of waste. The Ricoh Group aims at achieving perfect resource recycling by reducing, reusing, recycling resources and thermal recovery of waste. In fiscal 2000, zero waste was achieved at the Ricoh Group's domestic production sites, Ricoh Industrie France, and all production sites of Ricoh Electronics, Inc., (REI) in the United States.

Zero waste promotion staff at Ricoh Industrie France, which achieved zero waste in June 2000

Definition of Zero Waste to Landfill Levels by the Ricoh Group



The Ricoh Group changed its definition of level 3 zero waste to accommodate business sites. In the past, level 2 was regarded as level 3 for business sites that use public sewage systems. However, the Group renewed this definition because it did not feel that the definition was appropriate. The new definition of level 3 requires proof that sludge from public sewage systems is processed and recycled.

Disseminating Know-how

The Ricoh Group is doing its best to ensure that know-how is disseminated among all Group companies and that inner benchmarking is used to achieve more efficient promotion of Groupwide zero waste activities. In 1998, the people in charge of business sites in Japan established the Recycling Committee to share information on their efforts toward setting up environmental activities and improving employee awareness. The Group also strives to disseminate know-how globally by inviting the people in charge of overseas business sites to sites in Japan that have already achieved zero waste. In fiscal 2000, thorough waste quality control resulted in a number of improvements both at home and abroad, including the selling of waste for recycling. These examples of improvements that were made are listed in a case study database on waste that was set up for internal use.

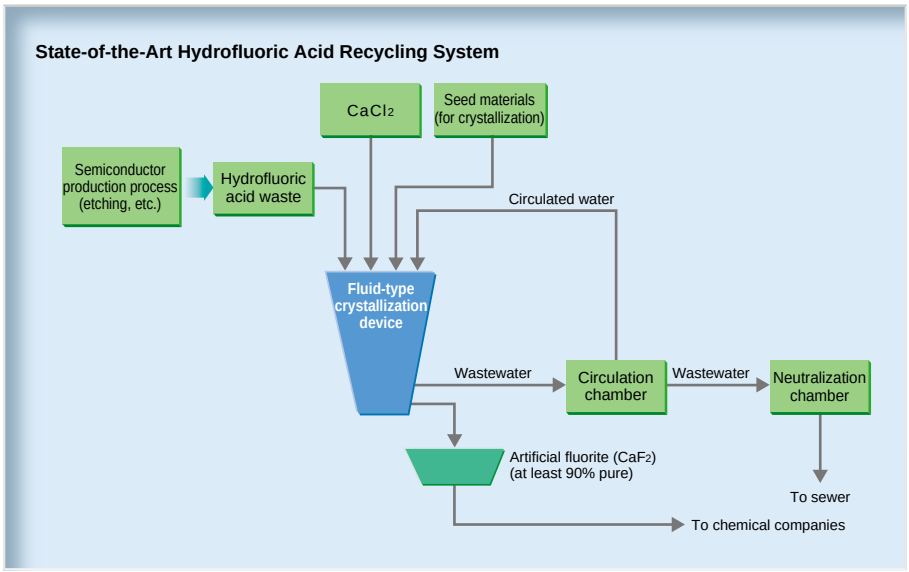
The 13th Recycling Committee Meeting held in Ricoh Microelectronics in November 2000

Hydrofluoric Acid Recycling in a Semiconductor Production Line

The Yashiro Plant, which produces semiconductors, introduced a hydrofluoric acid recycling system. This is the first system in the world that recovers hydrofluoric acid by using a crystallization method to turn the acid into fluorite, which can be reused to make hydrofluoric acid again. This system requires less space than the existing macromolecule coagulant system and enables the generation of artificial hydrofluoric acid of at least 90% purity that can be recycled as chemical ingredients.

Hydrofluoric acid is a chemical substance used in the etching process in semiconductor manufacturing. In the past, this substance was properly processed as sludge, but the introduction of the acid recycling system resulted in zero waste at a higher level by circulating the substance for recycling. This system contributed to modifications in the existing wastewater processing device, resulting in significant energy conservation. The New Energy and Industrial Technology Development Organization (NEDO)* approved a subsidy of this technology because of its innovation and energy conserving capability.

* http://www.nedo.go.jp/english/



Minimum Use of Water Resources

To wash its thermal paper production line, Ricoh Industrie France would use 25,353m^3 of water annually. It succeeded in cutting this volume 43.4% per usage by reviewing its cleaning process and modifying its method of cleaning with water to include air-pressure cleaning using a ball cleaner. Ricoh Industrie France is promoting activities under the belief that simple ideas and innovative action bring about economic benefits from environmental conservation activities.

Pipes being cleaned with a pressing ball cleaner and air pressure (Ricoh Industrie France)

Closed water system (Ricoh UK Products)

Ricoh UK Products, located in the U.K., adopted a closed system to circulate water used in toner manufacturing and cut water usage to 12% of the amount it previously used.

The Atsugi Plant, Ricoh Unitechno, and Taiwan Ricoh have installed wastewater recycling systems to filter and reuse plant wastewater for their sewer systems.

Zero Waste at Nonproduction Sites

The Ricoh Aoyama Office, which is a model for Companywide EMS, achieved zero waste in September 2000. Fukui Ricoh, a sales company in the Ricoh Group, also achieved zero waste as a part of its EMS activities. These achievements resulted in an improvement in employee awareness and a reduction in waste-processing cost.

Five Rs toward Zero Waste to Landfill

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

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

Minimum resource exploitation is being embraced by both the Ricoh Group and suppliers by simplifying packaging for parts and raw materials. Ricoh Industrie France reduced waste to 98% and is striving for 100% with thorough entrance control to eliminate such substances as PVC.

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

Improvements in delivery containers, such as designing them to be reusable and returning them to suppliers, not only reduces the exploitation of resources, but also reduces costs. Ricoh UK Products in the U.K. returns paper tubes and buffers to suppliers. It has also developed its own transportation containers that are foldable and easy to handle.

Foldable, easy-to-handle containers (Ricoh UK Products)

■ Zero Waste to Landfill Plants around the World

In fiscal 2000, a "zero waste culture" started in Japan and began to spread throughout Ricoh Group companies all around the world. The phrase "Promote Recycling for the Sake of Our Children's Future" was easily understood in countries with cultures different from that of Japan and spread around the world. To improve employee awareness of zero waste promotion activities, as many ideas as possible were encouraged. The following are examples of some of the inventive promotional activities that were given.

Each division has adopted the idea of carrying out the 5 Rs. Divisions, such as personnel, accounting, procurement, and manufacturing, have created their own ideas on how to do it. (U.S.A.)

Employees' questions (e.g., "Can this be recycled?") are answered within three days. Giving answers quickly is an important factor in zero waste activities. (U.S.A.)

Departments have free rein to personalize their sorting carts. This cart is decorated with photographs of the employees' children, which help motivate employees to sort waste for the sake of their children's future. (U.S.A.)

Zero Hero was created to champion zero waste activities. He came from the planet Zeron to Earth to promote environmental conservation activities. He appears on the company's Web site and posters. (U.S.A.)

Posting the plant's environmental policy at the entrance or in the lobby of the plant attracts the attention of suppliers and other visitors in addition to employees. (U.S.A.)

Quizzes on sorting are given throughout the plant. Employees answer questions on how familiar-looking waste should be sorted. Competitions are held among divisions. (U.S.A.)

At this plant, where people from a number of different ethnic origins work, posters written in five languages are put up. Some plants broadcast environmental conservation slogans in four languages. (U.S.A.)

Commitment to environmental conservation of each employee is posted on the wall. (U.S.A.)

3. Reduce (Reduce waste)

"Waste when mixed but resource when sorted." The quality control of waste along with efficient sorting 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.

Waste sorting as part of the thorough quality control of waste (REI, U.S.A.)

Several business sites have abolished the use of personal wastebaskets. (REI, U.S.A.)

4. Reuse

Reusing discarded office supplies that had been used only once results in resource conservation and cost reduction. The Ricoh Group sets up used office supplies sections in a number of offices in Japan and abroad, including the Aoyama Office, Ricoh Unitechno, and REI in the United States. Ricoh Industrie France cuts A3 paper (approx. 11 3/4 in. × 16 1/2 in.) used in testing copiers to A4 size (approx. 8 1/4 in. × 11 3/4 in.) and reuses it.

Used office equipment section (REI, U.S.A.)

Cutting A3 copier test paper to be reused as A4 paper (Ricoh Industrie France)

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.

A system to mix plastic waste generated in the manufacturing of parts with new materials to manufacture recycled parts (REI, U.S.A.)

Employees who have made outstanding contributions to garbage control, office equipment reuse, and industrial waste control are recognized and elected into the Environmental Hall of Fame. (U.S.A.)

Photos indicating how waste is to be sorted makes it easier for employees to observe rules. (U.K.)

Checking the level of sorting with green cards and red cards makes environmental conservation activities feel more like a game. (U.S.A.)

This mural was painted to increase employee awareness of environmental conservation. The following words were included: "God says, 'I love Mother Nature's green plants, I love the song of birds, I love green jade, and I love the scent of flowers, but most of all, I love the people who love these things." (Mexico)

To reduce the use of paper cups, mugs customized with each employee's name were distributed. (Mexico)

The recycling exhibition area is used to give easy-to-understand demonstrations on how waste is recycled. (U.K.)

Posters show how the 135 kinds of waste generated by the plant are recycled. (Mexico)

A poster of a "waste tree" easily explains how waste is sorted and recycled and how much money such practice earns. (U.K.)

This mural, dubbed the Sea Garden, at the recycling exhibition is of an ideal sea. (U.S.A.)