

Manufacturing Reform towards a Resource-Recirculating Society



Renovation efforts to greatly reduce the consumption of new resources and energy are now in progress with the aim of developing a manufacturing system for the next generation.

Resource depletion is increasingly becoming a reality, pushing manufacturing companies to change their methods of production. The Ricoh Group is shifting gear to realize a manufacturing style that matches the new era with the Comet Circle, a concept to realize a sustainable society.

The Comet Circle helps us use more recycled resources in more efficient ways

The Ricoh Group first introduced the Comet Circle in 1994 as a concept to promote our efforts to realize a sustainable society. It encourages reductions in the unnecessary use of resources and energy not only in manufacturing and sales of products but also in the total lifecycle, including upstream and downstream distribution.

For more than 15 years, the Ricoh Group has been promoting reuse and recycling programs with a focus on efficient use of resources and energy, while developing a network for recovering and recycling used products and parts, and designing products that can be more easily recycled. We are now accelerating the effects of the

Comet Circle and pursuing various types of reform to realize a next generation manufacturing system that will enable us to reduce consumption of new resources and energy.

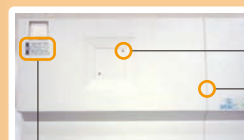


Product designing for easier recycling

Making products smaller and lighter while reusing and recycling used parts is a very effective way to conserve resources. Since 1993, the design division of the Ricoh Group has been developing original design methods under a firm policy on recyclable design. The main features of this include “parts designed for recycled copiers,” “easier dismantling and sorting,” “recyclable parts with higher values,” “high quality materials that can be reused,” “closed loop recycling” and “design of products that are durable enough for transport for recovery and reuse after recycle.” For easier dismantling and sorting, the number of dismantling processes was almost halved from 3,500 in the 1994 models to 1,800 in the 1999 or later models. More recently, we have set a regulation to give an estimation of the number of dismantling processes at the time of designing new products. These are just some examples of our efforts to reduce the man-hours and costs associated with assembly by improving the design of products so that they are easier to recycle. A design objective that ensures both products and packaging have sufficient strength to endure transportation is also followed closely. We have developed “resource-recirculating eco packaging,”¹ a packaging system which uses reusable resin packages for all our products.

1. See page 26.

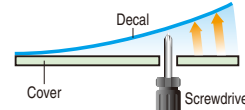
Recyclable design front cover



- **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.

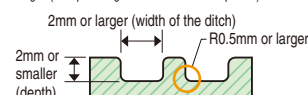
● The spot on the cover where the product name decal (sticker) is attached

By making a hole on the front cover at the spot where the product name decal is attached, the decal can be easily removed by inserting a screwdriver through the hole.



● 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 two millimeters or larger in width and 2mm or smaller in depth with a bottom round with R0.5mm or larger (except for figures and letter inscriptions).



Multifunctional digital color copier: imagio MP C2200²
The unit has the same footprint as its monochrome counterparts, helping customers to save office space.

2. See page 25.

Voice ① Voice of Employees

We develop products in smaller sizes with longer lives by fully using the Group's accumulated know-how

Ricoh has a long history of recyclable design, and we designers work hard every day to make our products more suitable for recycling. Design requirements that call for manufacturing using recovered parts often stand in the way of development of new mechanisms. However, the major effects of our everyday efforts have led to the development of new high-quality recycled products and the creation of new opportunities to reuse high-functional parts. Ultimately, we have been greatly contributing to reducing production costs. In April 2009, we revised level 6 of our “policy on recyclable design” to include standards for using larger amounts of recycled materials and making parts smaller



Members of the Recycling Technology Workshop (from left)
Mr. Masanori Yamanaka, Mr. Toshiyuki Mae (leader),
Mr. Masaki Kimura

and longer-lasting. We are now planning to expand the scope of our “recyclable design” concept for resource conservation and recycling from individual parts to the actual machine structure.

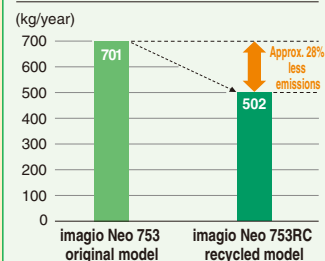
Creating a global network to facilitate the profitable use of reused parts

Recycling is most efficient both environmentally and economically when the recovered items are used in or close to the original form. To provide the recovered resources with greater value, we recover used copiers and manufacture new recycled copiers which are launched back in the market. We first dismantle and clean the recovered copiers, and change the necessary parts to rebuild the recycled copiers, which are sold with the same quality assurance as a new machine. Since December 2001, when we first launched the recycled multifunctional digital copier imagio MF6550RC in the market, we have expanded our lineup of recycled copiers, and in fiscal 2006, we achieved total sales of 10,000 units, making the recycled copier business profitable for the first time. The average rate of used parts in the production of the recycled copier, imagio Neo 753RC, reached 88% in weight. With this achievement, we have reduced the environmental impact by about 28% in the total lifecycle and by about 94% at the production phase compared with the original model¹. We are also engaged in further increasing the rates of used parts for production, while developing an optimal global-level network for recycling based on the highly



Recycled copier, imagio Neo 753RC².
This recycled multifunctional digital copier was awarded the Good Design Sustainable Design Award.

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



* 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).

* Emissions during the use phase are not included in the calculation.

efficient network we have already built within Japan. We will continue to pursue innovations in order to realize a manufacturing style that is superior in terms of both quality and economics.

1. Data are taken by comparing imagio Neo 753RC and imagio Neo 753 (the original model).

2. See page 26.