Ricoh has been developing production process/recycling technologies to reduce the environmental impacts of its production processes.

As part of this effort, and specifically to solve the problem of wastewater from the polymerized toner production process, and also in consideration of the risk of possible depletion of water resources in the future, Ricoh began conducting a joint project to develop and make practical use of a technology to recycle water used in manufacturing with REO Research Institute and the Research Institute for Environmental Management Technology of the National Institute of Advanced Industrial Science and Technology. This project was completed in 2010.

The next-generation water treatment technology developed in the project by applying REO Research Institute’s ozone micro–nano bubble technology can purify waste water from the polymerized toner production process by using energy derived from the bursting of fine ozone bubbles (below 300 nano-meters* in diameter). Water treated through this technology can be reused in the production process, thus providing a closed water recycling system. At present, some wastewater from Ricoh’s polymerized toner production process has to be incinerated because it is difficult to break down the water, which contains some very persistent organic matters, by chemical agents. In the closed water recycling system, however, the thermal treatment of the highly concentrated wastewater that is now conducted prior to the purification process will become unnecessary, and both the use of underground water and the amount of water eventually wasted from the process will be substantially reduced. The technology is expected to be applied to a range of production systems as an innovative environmental technology to save water resources and reduce CO2 emissions.

Ricoh aims to complete the closed recycling system for the polymerized toner production process within fiscal 2012.

*Nano–meter: 10–9 meter = one-billionth meter

Establishment of technology for recirculating and reusing industrial water with the ozone micro/nano bubble technology

![Diagram showing the recycling process](http://www.ricoh.com/environment/technologies/index.html)