Green Factories (procurement and production initiatives)

System Overview

Konica Minolta aims to create highly efficient production sites that minimize inputs of energy and resources, cut costs, and reduce environmental impact.

Konica Minolta has operated its original Green Factory Certification System for comprehensive evaluation of the environmental activities at its production sites since 2010. The purpose of this system is to bring costs down and reduce environmental impact by developing activities in line with each business's production strategy.

In this system, not only progress toward targets but also the implementation process is evaluated. In order to achieve clarity in the evaluation, guidelines have been prepared and a way created to quantify implementation conditions with a score. The guidelines bring together all of Konica Minolta's know-how in environmental measures and are comprised of approximately 250 implementation items as well as the evaluation standards for each item. The Group uses the guidelines to improve the quality of its activities.

Green Factory Certification Standards

Objectives	Management Indicators		Level 1	Level 2
Preventing global warming	CO_2 emissions (per unit of production*1)		12% reduction*6	20% reduction*6
Supporting a recycling-oriented society	Zero waste activities	Waste discharged externally*2 (per unit of sales*3)	30% reduction*6	50% reduction*6
		Final disposal rate of total waste	0.5% or less	0.5% or less
	Petroleum-based resource waste*4 (per unit of sales)		30% reduction*6	50% reduction*6
Reducing the risk of chemical substances	Atmospheric emissions of volatile organic compounds (VOCs)		Achievement of Fiscal 2011 Targets at each site based on Medium-Term Environmental Plan 2015	Achievement of fiscal 2015 targets at each site based on Medium-Term Environmental Plan 2015
	Guidelines for managing soil contamination risk		-	Consistent with guidelines
Restoring and preserving biodiversity	Guidelines for biodiversity preservation (consideration of water resources and wastewater, and proper management of greenery at factories)		-	Consistent with guidelines
Guideline-based activities	Achievement rate of implemented items*5		70% or more	90% or more

*1 Per unit of production: Environmental impact in terms of production output or production volume. Each business unit selects the measure that enables its productivity versus CO_2 emissions to be evaluated appropriately.

*2 Waste discharged externally: Volume discharged outside Konica Minolta sites, obtained by subtracting the internally recycled and reduced volumes from the total waste generated in production processes.

*3 Per unit of sales: Environmental impact in terms of sales.

*4 Petroleum-based resources waste: Volume of petroleum-based out of total volume of waste discharged externally.

*5 The guidelines have a 4-point evaluation benchmark ranging from 0 to 3 points for each implemented item and a standard score which serves as the performance target. The achievement rate refers to the percentage of items that meet the standard score relative to all items.

*6 The base year is fiscal 2005. Based on this numerical value, standards tailored to factory characteristics are established. However, in the event that there is a significant change to production items or production conditions due to business reorganization, the base year may be revised according to the Group's internal regulation.

- Guidelines for managing soil contamination risk
- Guidelines for Biodiversity Preservation

Green Factory Achievement Units

Konica Minolta's goal is to carry out initiatives in line with the Green Factory Certification System so that all business units achieve Level 2 in fiscal 2015.

In fiscal 2012, five business units (two in China and three in Japan) achieved Level 2 followed by three business units (one in China and two in Japan) in fiscal 2013, bringing the total to eight business units.

In fiscal 2013, these efforts produced a reduction of CO_2 emissions of about 57,000 tons and a reduction in the volume of external emissions of about 10,000 tons from the base year of fiscal 2005.

* A single business unit is an organization engaged in the same production activities even across different locations. A single location may include several business units.

- Green Factory Level 1 Achievement Units (PDF:31KB)
- Green Factory Level 2 Achievement Units (PDF:48KB)

Green Factory Level 2 Achievement Units

(i): Preventing global warming; (ii): Support for a recycling-oriented society; (iii): Reduction of the risk of chemical substances; (iv): Preserving biodiversity and managing soil contamination risk

Business Unit	Product	Main Measures	Year Achieved
Konica Minolta Opto Products Co., Ltd.	Pickup lenses for optical disks, lenses for laser printers	(i)Reduction in cycle time; increase in yield (ii)Reduction in the volume of waste runners produced, by reducing the diameter of unneeded plastic runners produced during plastic molding; reduction in raw materials (iv) Confirmation through WET testing using bioassays thagt waste water emitted to public water areas has no effect on the ecosystem	Fiscal 2012
Konica Minolta Opto (Dalian) Co., Ltd.	Pickup lenses for optical disks, glass lenses, lens units	(i)Increase in production efficiency through installation of automated machinery; improvement in work procedures for each process; increase in machine utilization (ii)Reduction in emission of waste runners by reducing the diameter of unneeded plastic runners produced during plastic molding; reduction in raw materials (iii)Reduction in discharge to the atmosphere of IPA through installation of automated machinery	Fiscal 2012
Konica Minolta Optical Products (Shanghai) Co., Ltd.	Lens units, optical modules, prisms, etc.	(i)Reduction in process area through changes in layout; reduction in cycle time; increase in yield (ii)Reduction in raw materials by reducing the diameter of unneeded plastic runners produced during plastic molding; expansion of effective use of waste runners	Fiscal 2012
Konica Minolta Technoproducts Co., Ltd. (Sayama)	Medical diagnostic imaging systems, photostimulable phosphorplates (FPD)	(i)Increase in production efficiency through changes in layout of production lines; space streamlining; increase in yield (ii)Reduction in packaging materials through effective product packaging	Fiscal 2012
Konica Minolta Technoproducts Co., Ltd. (Hino)	Photostimulable phosphorplates (CR)	(i) Increase in yield through reinforced dust protection (ii) Reduction in waste liquid through recycling of coating solution (iv) Management and protection based on a manual for rare species  (golden orchid; Cephalanthera falcata) on site	Fiscal 2012
Konica Minolta Business Technologies (Wuxi) Co., Ltd.,	Business technologies products such as MFPs as well as parts and	(i)Reduction in air-conditioning and lighting energy through productivity improvement measures based on Industrial Engineering (IE) Work Analysis (ii)Reduction in resin usage through	Fiscal 2013

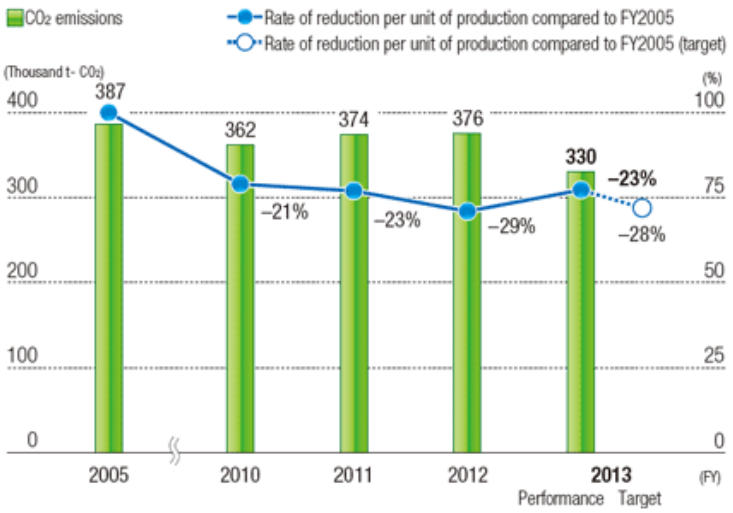
	consumables	development and adoption of molding dies that do not generate mill ends	
Konica Minolta Opto Device Co., Ltd.,	• Lens unit for projectors • interchangeable lens	(i)Improvement in yield rate and improvement in production efficiency (ii)Recycling of solvent for washing and reuse of packaging materials (iii) Reduction in atmospheric emissions of IPA for washing through installation of a VOC removal device	Fiscal 2013
Sensing Business Unit, Konica Minolta, Inc., Optics Company (Sakai Site)	• Measuring instruments for industrial use and medical use	(i)Improvement in production efficiency and optimization of equipment operation (ii)Reuse of packaging materials (iii)Complete review of the safety of subsidiary materials	Fiscal 2013

Energy savings and fighting global warming in production

Fiscal 2013 Targets and Results

Konica Minolta strove to reduce CO_2 emissions per unit of production using its Green Factory Certification System.

In order to reduce CO_2 emissions caused by production activities, Konica Minolta has operated its original Green Factory Certification System for comprehensive evaluation of the environmental activities of its production sites and improving energy productivity. In fiscal 2013, the Group moved forward systematically with energy-saving measures designed to minimize the effect of soaring energy prices. Despite these efforts, the target for fiscal 2013 was not attained due to the Group's withdrawal from the hard disk business and the reduction of production efficiency caused by the lower volume of display materials produced. Our continued efforts to reduce CO_2 emissions per unit of production in line with our Green Factory Certification System resulted in CO_2 emissions reduction by about 57,000 tons compared to the fiscal 2005 baseline.



CO_2 Emissions Resulting from Production Operations

Featured Initiative

Applying Expertise Acquired in Japan to Production Sites in China

Konica Minolta Business Technologies (Wuxi) Co., Ltd., in Jiangsu, China, adopted Industrial Engineering (IE) Work Analysis in 2012 as a new method for reducing environmental impact by improving productivity.

To adopt this method, Konica Minolta globally deployed its expertise on analysis accumulated in Japan. By thoroughly reconsidering the workability and flow of production lines at the Wuxi factory, the company there reduced production space, shortened production times, and cut energy consumption, including for air conditioning and lighting.

As a result of these initiatives, in March 2014 the Wuxi factory became the first production site for business technologies products to achieve Level 2 Green Factory certification.

Reduction of external emissions from production

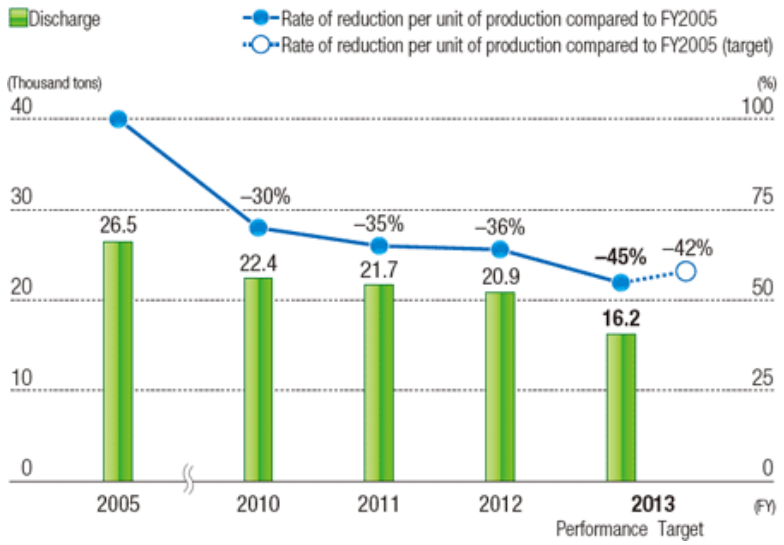
Fiscal 2013 Targets and Results (Waste Discharged Externally from Production Operations)

Konica Minolta carries out zero waste activities through the operation of its Green Factory Certification System.

Reducing Waste Discharged Externally from Production Operations

Konica Minolta is striving to reduce waste discharged externally from production operations, in order to help build a recycling-oriented society.

In fiscal 2013, the Group carried out “Zero Waste” activities such as improving production efficiency, expanding recycling of waste material, and expanding the reuse of packaging materials. As a result of these efforts, together with a closing of a production site in Malaysia, the Group achieved the targets for fiscal 2013. The reductions per unit of production attributable to Green Factory efforts resulted in a total reduction in externally discharged waste of about 10,000 tons compared to the fiscal 2005 baseline.



Waste Discharged Externally from Production Operations

Featured Initiative

Focusing on Reducing Raw Material Use, Including Plastic Mill Ends

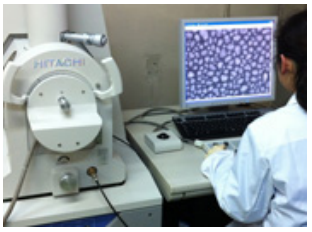
Konica Minolta Business Technologies (Wuxi) Co., Ltd., based in Jiangsu, China, makes an active effort to apply the 3Rs (reduce, reuse, and recycle) to the plastic mill ends generated in the molding process, in order to reduce waste.

In fiscal 2013, it greatly reduced its usage of plastic raw material by developing and installing molding dies that do not generate mill ends. Diverse measures including this one resulted in the achievement of a 60% reduction* in the amount of petroleum-derived resource waste and a 65% reduction* in the amount discarded externally compared to the base year of fiscal 2007.

These efforts helped the company to satisfy the Green Factory criteria of supporting a recycling-oriented society and resulted in achieving Level 2 Green Factory Certification.

* Both on a sales unit basis.

Developing Recycling Technology for the Rare Earth, Cerium Oxide



There are only a few supplier countries of rare earth materials worldwide, leading to concern about risks such as limited supply and rising costs. Also, rare elements must be used efficiently to realize sustainable human societies. Cerium oxide is a rare earth element used as a polishing material for glass. There has been a need to reclaim cerium oxide from waste liquid left after polishing, but the challenge was how to remove the glass particles.

Building on the advanced materials technology gained in the development of films and toners, Konica Minolta has successfully developed recycling technology able to extract high-purity cerium oxide which has the same quality as new material from polishing waste without large-scale equipment investment or high operating costs.

In October 2013, Konica Minolta won an Incentive Award in the Awards for 3R-Oriented Sustainable Technology in recognition of this initiative.

With the support of Japan's Ministry of Economy, Trade and Industry, the Japan Environmental Management Association for Industry gives these awards to advanced businesses and initiatives that contribute to reducing, reusing and recycling, with the objective of encouraging and popularizing their use. The Incentive Awards, one of which Konica Minolta won, are given to businesses or initiatives that have exhibited outstanding originality and growth potential in terms of new business creation.

Award ceremony

Reduction of chemical substances risks in production

Basic Concept

Working at reducing chemical risks based on the concept of the precautionary principle

There is international consensus on the need for companies that manufacture and use chemical substances to take steps to minimize the adverse effects of chemicals, not only on human health, but also on the environment. Based on this shared perception, many countries around the world are currently revising their regulations concerning chemical substances.

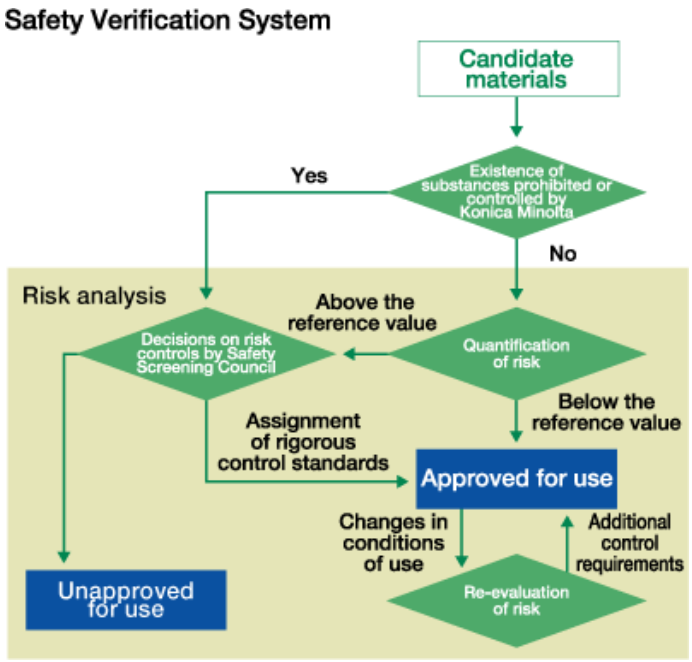
Having taken a position in advance of this new international current, based on a concept known as the "precautionary principle," Konica Minolta has focused on enhancing its advance evaluation of chemical risks, reducing the emission of harmful substances into the atmosphere and eliminating hazardous substances from production processes and products to improve safety management for workers and product users.

Risk Assessment of Chemicals

Using its unique safety verification system to achieve the appropriate management of chemicals

Risk assessment of candidate materials using a safety verification system

Konica Minolta has established a safety verification system that assesses the risk of candidate materials when considering the use of new chemicals in the process of creating products. Using this system, the Group practices appropriate management based on comprehensive chemical risk assessment in terms of product safety, environmental safety, and work safety.



Designation of prohibited and restricted substances

Konica Minolta designates prohibited and restricted chemicals based on its own criteria in order to appraise the inherent danger/hazard of a substance during the risk assessment conducted before adoption of a chemical. These criteria include not only chemicals regulated by law but also chemicals recognized as harmful by specialized institutions.

Calculating risk points for chemicals

Konica Minolta calculates points for the inherent danger/hazard risk of substances based on a unique calculation method used in its safety verification system. This quantifies the danger/hazardousness points based three factors: (1) type and degree of danger/hazardousness, (2) level of safety measures, and (3) amount used. Using these numbers, it is possible to compare different types of risks-such as the danger of an explosion or health effects such as carcinogenicity-on the same scale. In this way, Konica Minolta quantitatively assesses the potential risks of danger/hazardousness in chemicals.

Risk management that envisions substance usage

Moreover, since risks differ depending on the form of exposure, Konica Minolta classifies substances into four categories that envision usage, ranging from use under strict safety controls (e.g. at production sites) to use by the general public, which cannot be expected to take safety measures. It then specifies safety requirements according to the different risks in order to carry out more practical risk management.

When there is a necessity to use highly hazardous chemicals, Konica Minolta holds a safety determination meeting to stipulate rigorous management conditions for minimizing risks in terms of procurement, storage, handling, and disposal.

Risk assessment during continual use

Even after incorporating a chemical into the production process after conducting a risk assessment, Konica Minolta checks periodically to make sure that there are no changes in the amount used or the conditions of use. If there are any changes, it does a reassessment to ensure appropriate management.

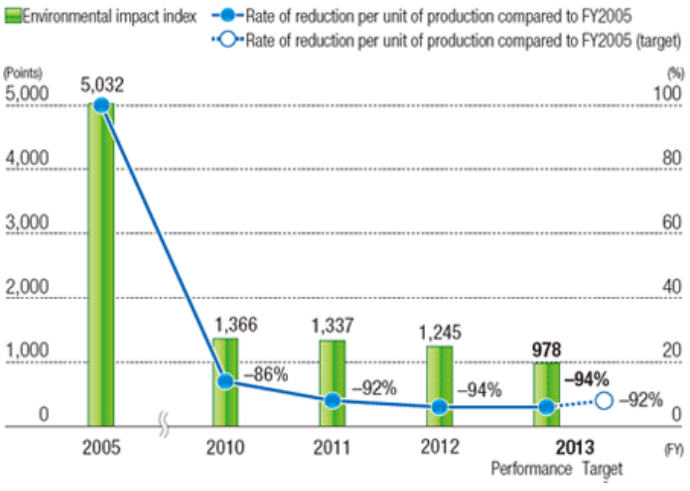
Reducing and Fully Phasing out Chemicals

Reducing VOCs based on Konica Minolta's own risk management indicators

Konica Minolta assesses risk based on a chemical's hazardousness and amount of use and is committed to finding alternatives and reducing those substances judged to have a high risk. Since 1993 it has been making efforts to reduce atmospheric emissions of volatile organic compounds (VOCs) from production sites worldwide. It identified VOCs with particularly high risks for full phase-out and has maintained the full phase-out status for those identified items.

Reducing atmospheric emissions of VOCs

Konica Minolta is systematically reducing VOCs in line with its own environmental impact index that multiplies the impact on the human body and the environment by a location coefficient as a management indicator. By implementing measures in accordance with the Green Factory certification system, it achieved its goals for fiscal 2013.



Reduction of Atmospheric VOC Emissions (Risk-Adjusted)

Standards for Calculating Environmental Data

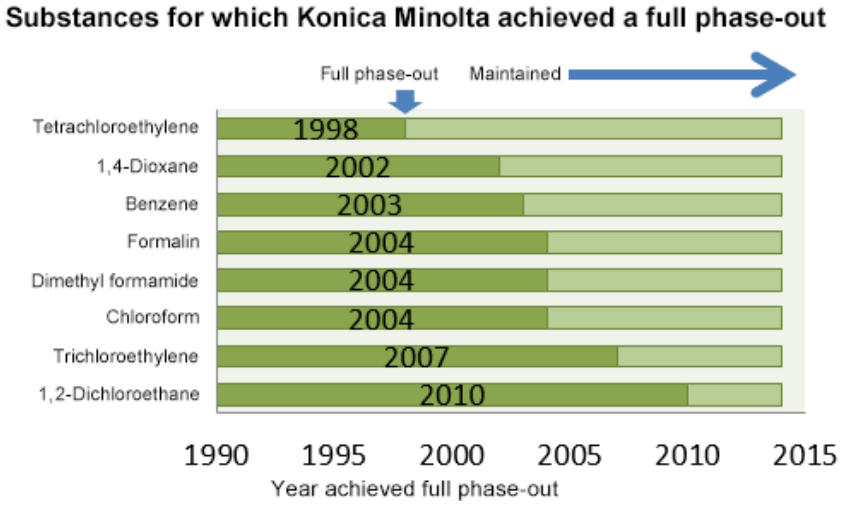
Substances Konica Minolta has earmarked for reduction

	Hazard coefficient	Example of substances
Substances that pose a risk to human health Substances that pose a risk to ecosystems Substances that pose a risk of atmospheric pollution	×100	1, 2-dichloroethane
	×10	dichloromethane, ethyl acrylate, n-heptane
Substances that pose risk of having an indirect adverse impact on the environment	×1	isopropyl alcohol, methanol, ethanol, acetone, ethyl acetate

* Environmental impact index:
Environmental impact index (point) = Atmospheric emissions of VOCs [t] × Hazard coefficient × Location coefficient
Hazard coefficient: Set at 1-fold, 10-fold, or 100-fold depending on the severity of the impact on human health and the environment (set independently by Konica Minolta based on the coefficient used in the safety evaluations conducted by Kanagawa Prefecture in Japan)
Location coefficient: Outside the industrial estate: 5, inside the industrial estate: 1

Substances for which Konica Minolta achieved a full phase-out

Konica Minolta earmarked the VOCs below for full phase-out, having judged them as having an especially high risk based on the hazardousness and amount of use of each substance, and made systematic efforts from early on toward that end. Those efforts resulted in the achievement of a full phase-out in fiscal 2010, which has been maintained ever since.



Countermeasures against Contamination of Soil and Ground Water

Striving to manage the state of contamination through regular monitoring, to facilitate cleanup, and to prevent the spread of contamination

Konica Minolta is conducting robust management through periodic observation at sites where soil or ground water contamination has been identified to ensure that the contaminants do not affect the surrounding environment.

The Group has organized a specialist team to manage remediation of polluted sites and to prevent the spread of contamination. Detailed surveys conducted under the team's supervision serve as the basis for developing countermeasures and examining suitable purification technologies.

The Group reports the results of its observations and remediation efforts periodically to local government agencies and to concerned neighboring residents.

› Summary of Contaminated Soil or Ground Water at Operation Sites

Establishment of guidelines for managing soil contamination risk

Guidelines have been set for risk management of soil contamination as part of Konica Minolta's unique Green Factory Certification System for comprehensive evaluation of the environmental activities of its production sites, as the certification standards for Level 2 require compliance with these guidelines from April 2011.

Guidelines for managing soil contamination risk

• The risk of soil contamination has been assessed through preliminary surveys at production sites known to have a high risk from past surveys.
• If soil contamination (in excess of the standard value) is observed, measures are taken to prevent damage to human health.
• Measures are also taken to prevent run-off of contamination outside the site.

Addressing biodiversity in production

Consideration of Biodiversity at Production Sites

Konica Minolta is carrying out efforts in accordance with the Guidelines for Biodiversity Preservation.

Konica Minolta is working to preserve biodiversity as part of its unique Green Factory Certification System for comprehensive evaluation of the environmental activities of its production sites.

In April 2011, guidelines have been set for consideration of water resources and wastewater, and the proper management of greenery at factories, since the certification standards for Level 2 require compliance with these guidelines.

Guidelines for Biodiversity Preservation

<Consideration of water resources>
• Reduction targets are set for total water consumption, or for water used on site, and reduction measures are implemented
• If groundwater is used, measures must be taken to reduce the amount used

<Consideration of wastewater>
• In order to prevent ecological damage to rivers and lakes, a risk management system must be established to eliminate highly polluted wastewater
• Checks are in place to determine the impact of wastewater emitted into public water areas on ecosystems, such as aquatic habitats

<Proper management of greenery at factories>
• Invasive alien species that are likely to have a negative impact on ecosystems are not planted or sown on the factory's premises
• When planting trees on factory grounds, management and protection must be accorded to any rare species that are discovered

Consideration of water resources

Konica Minolta monitors and manages the volume of water use at each site and strives to reduce its total water consumption in line with the reduction targets it has established.

In fiscal 2013, the Group conducted a comprehensive risk assessment on usage of water resources at production sites and R&D sites throughout the Group. Results of an analysis conducted using the World Resources Institute's (WRI) Aqueduct* showed that the Group has no sites with an extremely high risk. Some production sites in China that were identified as having a comparatively high water risk have now set water use reduction targets and are working toward achieving such targets through measures such as installing water-saving faucet valves, checking for leakage from piping and repairing piping damage.

In the future, the Group will continue to conduct water risk assessments when establishing new sites and changing the business environment, and it will take measures to reduce water use as necessary.

Additionally, production sites that use groundwater as their main intake source have set reduction targets with an indicator of the percentage of groundwater use accounted for in production output (i.e. per unit of production). They are making efforts to reduce the use of groundwater, such as by turning off the supply of cooling water when production is stopped.

* Aqueduct: World maps and information showing the latest water risks published by the WRI. Produced based on 12 key water risk indicators such as physical water stress and regulatory risk related to water resources.

Consideration of wastewater

Konica Minolta regularly conducts compliance assessments on a global basis to confirm the status of compliance with laws, ordinances, agreements, and other relevant regulations related to effluent with the aim of preventing water pollution from effluent.

In fiscal 2011, the Group assessed the effect of effluent on the ecosystem at production sites that release effluent used in the production process into rivers. It adopted WET,* a new effluent management method using bioassays that is gaining worldwide attention, when conducting the assessments. With the cooperation of Japan's National Institute for Environmental Studies, the Group conducted tests using three aquatic species (algae, crustaceans, and fish). The results indicated that there was no negative impact (algae: inhibition of growth; crustaceans: inhibition of breeding; fish: reduced hatching rate or reduced survival rate after hatching) on any of the three test organisms.

* WET: A method that assesses the aggregate toxic effect of wastewater on aquatic life rather than the volume of individual chemical substances. Unlike conventional effluent management methods, it enables holistic assessment of the effect of an effluent, detecting impact caused by any non-regulated chemical substance or the combined impact of multiple substances.

Proper management of greenery at factories

Konica Minolta practices proper management of greenery on the grounds of the Group's production sites. By preparing greenery management lists for each site and conducting periodic checks, it makes sure that there are no invasive species, including sowing seeds.

Additionally, when rare species are discovered at a site, efforts are made to protect the species by making employees and visitors aware of its presence by putting up signs and fences. For instance, the Tokyo Site Hino is managing and protecting Golden Orchid (Cephalanthera falcata) and Lilium speciosum (a Japanese lily), which are endangered species.

Consideration of biodiversity in procurement

Procuring copy paper in consideration of forest resource conservation

Konica Minolta Business Solutions Co., Ltd., an office equipment and solutions sales company in Japan, has established the PPC Paper Purchase Standards, which have been implemented since 2007. The Standards stipulate that copy paper supplied to customers should be procured by taking into account the impact of forest destruction and degradation on the living environments of animals, plants, and people.

Reduction of environmental impact through cooperation with suppliers

Reducing CO_2 Emissions by Cooperating with Suppliers

Konica Minolta facilitated environmental impact reduction through improvement of suppliers' production processes.

About 26% of Konica Minolta's CO_2 emissions across the supply chain are related to the procurement of parts. By working with suppliers to improve production processes, Konica Minolta is making progress in reducing both costs and environmental impact. Improved quality and productivity and reduced cost are the primary objectives of these efforts, but they also translate into reduced environmental impact by saving on materials and energy used.
Under the program, Konica Minolta engineers visit suppliers' plants and propose improvements that help reduce the usage of raw material plastic and shorten lead times. They work side by side with supplier employees to make these improvements. Reduced plastic usage not only saves on material itself, but also means that less CO_2 is emitted during material manufacturing. Shorter lead times reduce energy consumption and translate into reduced CO_2 emissions by improving production efficiency. In fiscal 2013, these initiatives resulted in a total of nearly 1,800 tons of CO_2 reductions for the year.
The Medium-term Environmental Plan 2016 sets CO_2 reduction targets related to procurement in addition to CO_2 reduction targets for Group production sites. The Group continues to expand its cooperation with suppliers with the aim of achieving these targets.