Control of Chemical Substances

Targets

[Chlorinated organic solvents]
- **Reduction in use of chlorinated organic solvents in wash at all workplaces including major manufacturing subsidiaries, by at least 80% compared with figures from fiscal 1999.**

Chemical substances have the potential to improve our lives in many ways, but at the same time can cause many serious problems such as ozone layer depletion, dioxin poisoning and the environmental endocrine effect — the spread of harmful elements throughout nature. In order to forestall this sort of damage, it is vital that the use of chemical substances be carefully controlled, that the amount of chemicals used is reduced, and that safer substances are substituted wherever possible.

Nikon is currently devising a management system that will enable us to effectively take all of these actions.

Substance Control Procedures

Nikon performs chemical substance control at every phase of the product life cycle, from purchase through use and disposal, in order to stop pollution caused by these substances. When first purchasing a new chemical substance, we obtain a Material Safety Data Sheet (MSDS) for the item, and carry out an assessment of the potential dangers of its use in the workplace. Based on the results of this assessment, our Environment, Safety and Hygienics section performs a review and confirmation of actions taken.

In addition to these measures, our Data Centre, located at the Ohi Plant, carries out intensive management of registration, updates and storage of MSDS.

Nikon's PRTR

The Pollutant Release and Transfer Register (PRTR) Law has been enacted in Japan as well, and daily management of chemical substances and diligent risk management are key factors in promoting business.

The "Nikon PRTR Guide" was released in March 2000, and management activity for the specified chemical substances is underway at each plant. This guide serves as a safety management standard which clearly outlines handling and disposal according to MSDS, for all product phases from procurement to use and disposal.

In March 2002, Nikon established a company system for legal notification, adding to and revising existing procedures for filling out such notifications.

Reporting quantities of one ton or more has become required by law as of fiscal 2004. In accordance with the statute, here are the reports for each of our plants.

Nikon PRTR Guide

PRTR Survey Results for fiscal 2004

Unit: kg/year

Facility	Substance No.	Substance name	Volume handled	Amount released			Amount transferred		Amount in on-site landfill	Amount removed for processing	Amount shipped in product
				Air	Public water	Soil	Sewage	Waste			
Ohi Plant	144	Dichloropentafluoropropane	1,401	475	0	0	0	926	0	0	0
Yokohama Plant	145	Dichloromethane	2,747	2,697	0	0	0	50	0	0	0
Sagamihara Plant	230	Lead and lead compounds	3,301	2	0	0	0	1,351	0	0	1,948
	304	Boron and boron compounds	4,099	3	0	0	0	1,674	0	0	2,422
Kumagaya Plant	227	Toluene	1,314	898	0	0	0	416	0	0	0

* The above table includes data only for specified substances of which one or more tons are handled per year per facility. No such substances exist at Mito Plant.

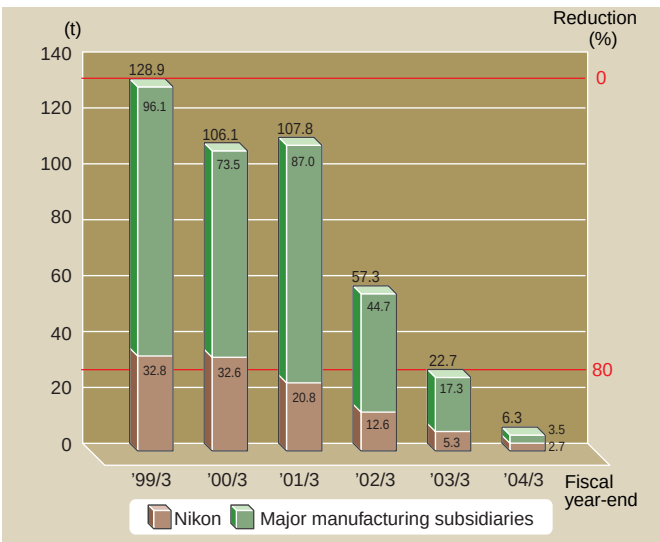
Reduction in Chemical Substances

The key question is how to best reduce the amount of chemical substances used. This is more than merely avoiding the risk of environmental pollution, and in fact signifies an improvement in Nikon's design and production systems. We are constantly working to reduce the volume of chemical substances used which have the most adverse effects on the environment, searching for alternatives, and making every effort to achieve zero chemical pollution.

Efforts to Eliminate Chlorinated Organic Solvents

We have established a target for total elimination of chlorinated organic solvents in wash applications by the end of fiscal 2006, and are now switching over to hydrocarbon wash agents and similar substances that have minimal effect on the environment.

The graph at right shows amounts used since fiscal 1999. The amount used in fiscal 2004 was 95% less than in fiscal 1999 — we achieved our goal of a reduction of no less than 80%.



Prevention of Pollution and Protection of Air, Water and Land

To help preserve air and water quality, Nikon not only observes applicable laws and regulations, but has also established its own independent plant standards for management.

Each plant regularly measures pollutants released into the air and water, and inspects equipment such as boilers and waste water processing systems periodically to ensure safety.

Air and Water Quality Environmental Data for Fiscal 2004

Ohi Plant

1-6-3, Nishi-Ohi, Shinagawa-ku, Tokyo 140-8601
+81-3-3773-1307

Air (Air Pollution Control Law, Metropolitan Regulations)

Unit: Dust: g/Nm^3, NOx (nitrous oxides): ppm

Item		Regulatory standard	Plant standard	Actual (max.)
Boiler	Dust	0.15	0.12	0.003
	NOx	45	45	43
Cooling and heating equipment/ appliance	Dust	0.15	0.12	0.012
		0.15	0.12	0.009
		0.15	0.12	0.015
	NOx	45	45	29
		45	45	27
		45	45	26

Water Quality (Sewerage Law, Metropolitan Regulations)

Unit: mg/l, except for pH

Item		Regulatory standard	Plant standard	Actual (max.)
Living environment	pH	5.8-8.6	5.9-8.5	6.3-8.1
	BOD	300	240	162.8
	SS	300	240	144.9
	n-hexane (animal/vegetable)	30	24	22.5
	Iodine demand	220	176	3.9
	Copper	3	2.4	0.1
	Zinc	5	4	0.2
	Soluble iron	10	8	0.7
	Total chrome	2	1.6	0.0
	Fluorine	15	12	3.1
	Nitrogen	120	96	17.4
	Phosphorous	16	12.8	1.13
Health	Lead	0.1	0.08	0.00
	Dichloromethane	0.2	0.16	0.00

Yokohama Plant

471 Nagaodai-cho, Sakae-ku, Yokohama, Kanagawa 244-8533
+81-45-852-2111

Air (Air Pollution Control Law, Prefectural Regulations)

Unit: NOx (nitrous oxides): ppm

Item		Regulatory standard	Plant standard	Actual (max.)
Boiler	NOx	65	60	29
		65	60	34
		65	60	37
		46	42	21
		46	42	29
		46	42	30

Water Quality (Sewerage Law, Prefectural Regulations, City Regulations)

Unit: mg/l, except for pH

Item		Regulatory standard	Plant standard	Actual (max.)
Living environment	pH	5.0-9.0	5.5-8.5	5.8-7.4
	BOD	600	540	5.0
	SS	600	540	9.7
	n-hexane (mineral)	5	4.5	6.5 *1
	Iodine demand	220	200	1.5
	Copper	1	0.9	0.0
	Zinc	1	0.9	0.0
	Soluble iron	3	2.7	0.1
	Soluble manganese	1	0.9	0.0
	Total chrome	2	1	0.0
	Nickel	1	0.9	0.0
	Fluorine	8	7	1.5
	Boron	10	8	0.2
Health	Lead	0.1	0.1	0.02
	Arsenic	0.1	0.1	0.00
	Hexavalent chrome	0.5	0.4	0.00
	Trichloroethylene	0.3	0.2	0.00
	Tetrachloroethylene	0.1	0.1	0.00
	Dichloromethane	0.2	0.1	0.00

*1 Occurred August 2003 (exceeded regulatory standard)
Cause: Temporary inflow of oil and fat content from the facility into the drainage tank.
Corrective action: Recovered the drainage and cleaned the tank; strongly urged corrective action be taken to prevent similar accidents to the related department.

* For explanations of terms such as ppm and pH, see glossary on page 25.

Sagamihara Plant

1-10-1 Asamizodai, Sagamihara, Kanagawa 228-0828
+81-42-740-6300

Air (Air Pollution Control Law, Prefectural Regulations)

Unit: Dust: g/Nm^3, NOx (nitrous oxides): ppm

Item		Regulatory standard	Plant standard	Actual (max.)
Boiler	Dust	0.15	0.1	0.0016
		0.15	0.1	0.0018
		0.15	0.1	0.0027
		0.15	0.1	0.0015
		0.15	0.1	0.002
		0.15	0.1	0.005
	NOx	105	100	38
		105	100	43
		105	100	41
		105	100	8
		105	100	7
		105	100	5

Water Quality (Sewerage Law, Prefectural Regulations)

Unit: mg/l, except for pH

Item		Regulatory standard	Plant standard	Actual (max.)
Living environment	pH	5.7-8.7	6.0-8.0	6.6-7.5
	BOD	300	60	27
	SS	300	90	<10.0
	Zinc	3	0.5	0.08
	Fluorine	12	10	4.1
	Boron	10	5	0.37
	Ammoniac nitrogen	100	100	14
Health	Lead	0.1	0.08	0.05
	Arsenic	0.1	0.05	<0.01
	Dichloromethane	0.2	0.1	<0.002

Kumagaya Plant

201-9 Oaza-miizugahara, Kumagaya, Saitama 360-8559
+81-48-533-2111

Air (Air Pollution Control Law, Prefectural Regulations)

Unit: Dust: g/Nm^3, NOx (nitrous oxides): ppm

Item		Regulatory standard	Plant standard	Actual (max.)
Boiler	Dust	0.1	0.05	0.001
		0.1	0.05	0.001
		0.1	0.05	0.001
		0.1	0.05	0.001
		0.1	0.05	0.001
		0.1	0.05	0.001
		0.1	0.05	0.001
		0.1	0.05	0.001
		0.1	0.05	0.003
		0.1	0.05	0.001
	NOx	150	100	49
		150	100	51
		150	100	78
		150	100	89
		150	100	73
		150	100	98
		150	100	56
		150	100	46
		150	100	44
		150	100	72
		150	100	77

Water Quality (Sewerage Law, Prefectural Regulations)

Unit: mg/l, except for pH

Item		Regulatory standard	Plant standard	Actual (max.)
Living environment	ppH	5.1-8.9	5.9-8.2	6.4-7.4
	BOD	600	150	5.9
	SS	600	50	14.0
	n-hexane (mineral)	5	4	<1.0
	n-hexane (animal/vegetable)	30	20	2.0
	Iodine demand	220	170	<0.2
	Copper	3	0.5	<0.2
	Zinc	5	0.5	<0.05
	Soluble iron	10	3	<0.3
	Total chrome	2	1	<0.2
	Boron	10	4	1.8
	Nitrogen	240	60	24.0
	Ammoniac nitrogen	100	30	17.5
	Phosphorous	32	15	7.8
Health	Cyanide	1	0.2	<0.1
	Lead	0.1	0.05	<0.01
	Hexavalent chrome	0.5	0.1	<0.05

Mito Plant

276-6 Motoishikawa-cho, Mito, Ibaraki 310-0843
+81-29-240-1112

Air (Air Pollution Control Law, Prefectural Regulations)

Unit: Dust: g/Nm³, NOx (nitrous oxides): ppm, SOx (sulfurous oxides): Nm³/h

Item		Regulatory standard	Plant standard	Actual (max.)
Boiler	Dust	0.3	0.27	0.007
		0.3	0.27	0.011
		0.3	0.27	0.016
	NOx	180	162	69
		180	162	50
		180	162	69
	SOx	3.25	0.67	0.013
		3.25	0.67	0.019
		3.25	0.67	0.030

Water Quality (Water Pollution Control Law, Prefectural Regulations)

Unit: mg/l, except for pH and E. coli (colonies/ml)

Item		Regulatory standard	Plant standard	Actual (max.)
Living environment	pH	5.8-8.6	6.0-8.2	6.7-7.4
	BOD	20	20	15.0
	SS	30	30	68 *1
	n-hexane (animal/vegetable)	10	10	1.0
	E. coli (daily average)	3,000	2,700	174
	Nitrogen	60	60	57.6
	Phosphorous	8	8	4.39

*1 Occurred May 2003 (exceeded regulatory standard)
Cause: Accumulation and decomposition of treated water in the digestion tank during long holidays.
Corrective action: Ensure fluoroscopic check and water purifying are performed prior to long holidays to prevent decomposition.

Soil Contamination Protection Measures (Sagamihara Plant)

After the existing waste water treatment plant was dismantled in November 2002, a soil analysis carried out in accordance with Sagamihara City directives revealed fluorine contamination.

The five-point composite sample method* of analysis produced a result of 0.95mg/litre, exceeding the maximum allowed by local regulations, 0.8mg/litre.

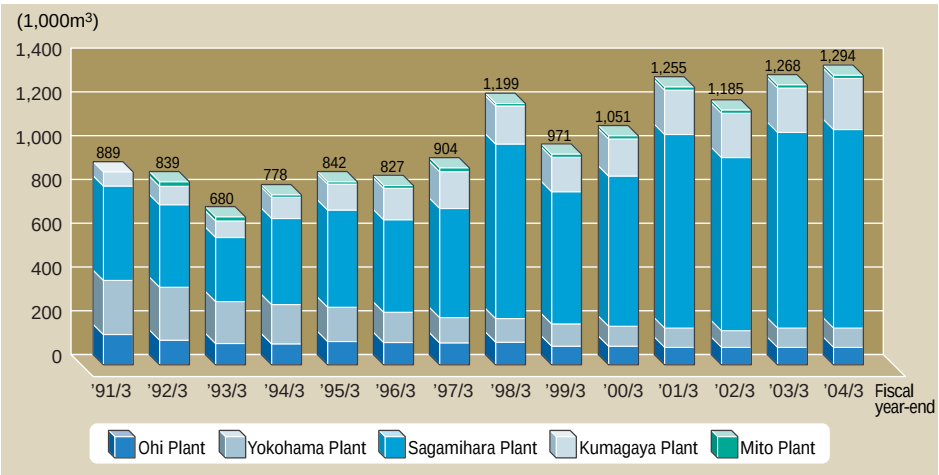
Investigative drilling was performed, identifying the area affected by the contamination, and Sagamihara City regulations were followed in processing. An investigation into possible restoration plans was made, and in February 2004 the contaminated soil was replaced by clean soil. The contaminated soil was processed appropriately as industrial waste (to be used as raw material for cement).

* Maximum width 8m, length 9m, and depth 3.5m. Total contaminated soil volume was about 48m³.

It was confirmed that the contamination had not pervaded the local underground water system.

Water Usage

Plants engaged in manufacturing continuously expand and evolve structurally, but since the introduction of the "Environmental Management System" in fiscal 1999, efforts have been made to promote reuse of process waste water, and reduce water usage by involving all employees in water-saving activities.



Glossary

ppm: Parts per million

pH: Hydrogen ion concentration
Indicates the acidity or alkalinity of a substance, where a solution of pH 0 to 7 is acid, pH of 7 is neutral, and a pH over 7 is alkaline. A change of one pH number indicates a 10-fold change in the concentration of hydrogen ions.

BOD: Biochemical oxygen demand
The amount of oxygen required for microorganisms to oxidise and consume organic pollutants in water. Used to gauge the degree of pollution of rivers.

SS: Suspended solids
Also referred to as substances that cause water clouding, they include small particles, plankton, organism carcasses and detritus, excretions and other organic materials, as well as sand, mud and inorganics and a range of man-made pollutants.

n-hexane (mineral or animal/vegetable): Normal hexane mass
Used to measure the total content of oils and hydrocarbons in waste water, it indicates the amount of materials extracted to normal hexane and which do not volatilise at about 100°C. Covers animal and vegetable oils, fatty acids, petroleum-based hydrocarbons, wax and grease.

Iodine demand
The amount of iodine used by the reducing substances (sulphide, etc.) in waste water during iodine oxidation. It is an index of the presence of the reducing substances in waste water.