Conservation of the Regional Environment and Working Environment

Regional Environment Conservation

Preserving air and water quality

Each of our plants has its own regulations and agreements concerning environmental emissions. These self-governing standards, which are in most cases even stricter than those of the surrounding area, are carefully monitored in an ongoing effort to prevent water and air pollution.

■ Example of water quality (Shiga Plant)

Regulated substance	*National regulation*	*Shiga Prefecture regulation*	*Kosai Town regulation*	*Private control value*	*Measured value*
PH (hydrogen ion concentration)	5.8~8.6	6.0~8.5	6.0~8.5	6.3~8.1	7.2
BOD (biochemical oxygen demand)	160 (mg/ℓ) (daily average 120)	50	20	15	2.8
COD (chemical oxygen demand)	160 (mg/ℓ) (daily average 120)	50	20	15	7.0
SS (suspended solids)	200 (mg/ℓ) (daily average 150)	70	20	15	10.4
N - hexane (mineral oil)	5 (mg/ℓ)	5		3.5	Not detected (<0.6)
N - hexane (animal/vegetable oil)	30 (mg/ℓ)	20		15	Not detected (<0.6)
Phenols	5 (mg/ℓ)	1		0.8	Not detected (<0.005)
Copper	3 (mg/ℓ)	1		0.8	Not detected (<0.04)
Zinc	5 (mg/ℓ)	1		0.8	Not detected (<0.02)
Dissolved iron	10 (mg/ℓ)	10		8	0.03
Dissolved manganese	10 (mg/ℓ)	10		8	Not detected (<0.02)
Chrome	2 (mg/ℓ)	0.1		0.08	Not detected (<0.02)
Fluorine	15 (mg/ℓ)	8		6.5	Not detected (<0.2)
B-coli types	3000/cc	3000		2400	Not detected (<0)
Boron		2 (mg/ℓ)		1.5	0.03
Antimony		0.05 (mg/ℓ)		0.04	Not detected (<0.01)
Nitrogen	120 (mg/ℓ) (daily average 60)	8		6.5	5.05
Phosphorus	16 (mg/ℓ) (daily average 8)	0.8		0.65	0.14
Cadmium and its compounds	0.1 (mg/ℓ)	0.01		0.008	Not detected (<0.005)
Cyanides	1 (mg/ℓ)	0.1		0.08	Not detected (<0.01)
Organic phosphoric compounds	1 (mg/ℓ)	Not detectable		Not detectable	Not detected (<0.01)
Lead and its compounds	0.1 (mg/ℓ)	0.1		0.08	Not detected (<0.05)
Hexavalentchromium compounds	0.5 (mg/ℓ)	0.05		0.04	Not detected (<0.02)
Arsenic and arsenic compounds	0.1 (mg/ℓ)	0.05		0.04	Not detected (<0.02)
Total mercury	0.005 (mg/ℓ)	0.005		0.004	Not detected (<0.0005)
Alkyl mercury compounds	Not detectable	Not detectable		Not detectable	Not detected (<0.0005)
PCB	0.003 (mg/ℓ)	0.003		0.002	Not detected (<0.0005)
Trichloroethylene	0.3 (mg/ℓ)	0.3		0.24	Not detected (<0.001)
Tetrachloroethylene	0.1 (mg/ℓ)	0.1		0.08	Not detected (<0.001)
Dichloromethane	0.2 (mg/ℓ)	0.2		0.16	Not detected (<0.001)
Carbon tetrachloride	0.02 (mg/ℓ)	0.02		0.016	Not detected (<0.001)
1.2-dichloroethane	0.04 (mg/ℓ)	0.04		0.03	Not detected (<0.001)
1.1-dichloroethylene	0.2 (mg/ℓ)	0.2		0.16	Not detected (<0.001)
Cis-1.2-dichloroethylene	0.4 (mg/ℓ)	0.4		0.32	Not detected (<0.001)
1.1.1-trichloroethane	3 (mg/ℓ)	3		2	Not detected (<0.001)
1.1.2-trichloroethane	0.06 (mg/ℓ)	0.06		0.048	Not detected (<0.001)
1.3-dichloropropene	0.02 (mg/ℓ)	0.02		0.016	Not detected (<0.001)
Thiram	0.06 (mg/ℓ)	0.06		0.048	Not detected (<0.001)
Simazine	0.03 (mg/ℓ)	0.03		0.024	Not detected (<0.0003)
Thiobencarb	0.2 (mg/ℓ)	0.2		0.016	Not detected (<0.002)
Benzene	0.1 (mg/ℓ)	0.1		0.08	Not detected (<0.001)
Selenium and selenium compounds	0.1 (mg/ℓ)	0.1		0.08	Not detected (<0.02)

■ Example of air quality

Facility	*Plant*	*Regulated item*	*Unit*	*National regulation*	*Local regulation*	*Agreement/value*	*Private control value*	*Measured value*
Cupola	Mukogawa	Dust	g/m³N	0.1	0.1	0.1	0.05	0.004
Cupola	Funabashi	Dust	g/m³N	0.1	0.1	0.1	0.05	0.01
Waste incinerator	Shinyodogawa	Dioxins	ngTEQ/m³N	80	80	—	64	1.5
Waste incinerator	Shiga	Dioxins	ngTEQ/m³N	80	80	—	64	5.3
Waste incinerator	Odawara	Dioxins	ngTEQ/m³N	80	80	—	64	1.2

Preventing groundwater pollution

Between June and August 1998, we conducted a study at 19 of our domestic production plants, four machinery-related production plants overseas, and six domestic production-related plants and manufacturing companies, to find out how organic chlorine-based compounds are being used, and the effects of those compounds. We also analyzed the groundwater from three plants where trichloroethylene is used. As a result, we were able to confirm that the values are below the environmental standard values at all of the plants tested.

■ **Results of underground water study at plants using trichloroethylene**

Plants	*Substance used*	*Period of use*	*Annual volume used (fiscal 1998)*	*Measured value of underground water (max. value at site)*	*Environmental standard value*
Utsunomiya	Trichloroethylene	1993 ~ 1998	6.7 tons	Not detected (<0.001 mg/ℓ)	0.03mg/ℓ
	Dichloromethane	1993 ~ 1998	0.3 tons	Not detected (<0.002 mg/ℓ)	0.2mg/ℓ
	Tetrachloroethylene	1982 ~ 1986	None	Not detected (<0.0005 mg/ℓ)	0.01mg/ℓ
	1.1.1-trichloroethane	1987 ~ 1993	None	Not detected (<0.0005 mg/ℓ)	1mg/ℓ
Tsukuba	Trichloroethylene	1993 ~ 1998	1.0 tons	Not detected (<0.0001 mg/ℓ)	0.03mg/ℓ
	1.1.1-trichloroethane	1991 ~ 1993	None	Not detected (<0.0001 mg/ℓ)	1mg/ℓ
Naniwa	Trichloroethylene	1993 ~ 1998	14.0 tons	Not detected (<0.002 mg/ℓ)	0.03mg/ℓ
	1.1.1-trichloroethane	1977 ~ 1993	None	Not detected (<0.001 mg/ℓ)	1mg/ℓ

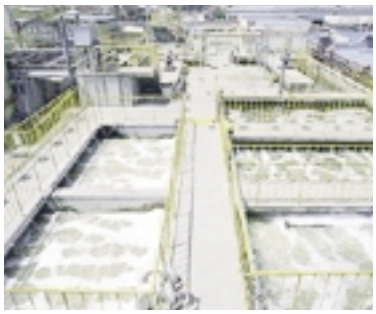
Preventing effluent accidents

With underground pipes used to carry oil, there is always a possibility of leakage if the pipes corrode or deteriorate because of soil or groundwater elements.

At Kubota, we instituted a comprehensive ban on underground oil-carrying pipes in 1995, in order to prevent effluent accidents.

Also, we installed meters at exit ports to measure pH, COD, and oil levels, and we monitor effluent 24 hours a day.

Example of underground oil-carrying pipe improvement (Sakai factory)



Shiga Plant

In order to assure workplace safety and employee's health and well-being, and to prevent pollution of the regional environment, we are committed to ongoing improvement of our working environment, with special focus on noise and chemical substance control.

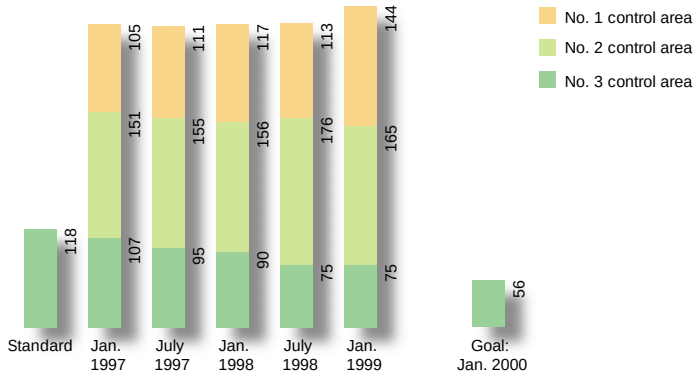
Noise

The plant in our No. 3 control area was chosen as a particular target for noise improvement goals. In fiscal 1997 we initiated a program to reduce noise at this plant by half in a three-year period, and at present, we are moving towards our goal on schedule. During fiscal 1997 and 1998 we invested approximately 640 million yen in noise improvement measures.

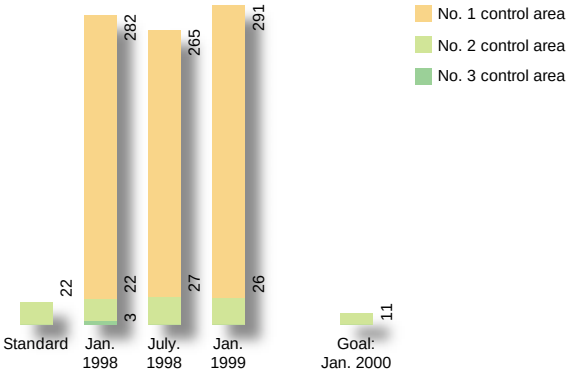
Toxic substances

There are no work sites in the No. 3 control area handling toxic substances (coarse particulates, organic solvents, special chemicals, and lead), but we continue to strive to make work sites in this area more pleasant, comfortable places to work.

Changes in the number of plants targeted for company-wide noise reduction measures



Changes in the number of plants targeted for company-wide toxic substance measures (coarse particulates, organic solvents, special chemicals, and lead)



Chemical Substance Control

At Kubota, we are striving to prevent environmental pollution both inside and outside our plants, by implementing appropriate control of chemical substances. At the same time, we are working to reduce the amounts used and the transfers (discarding) of these chemicals.

PRTR aggregate results (as of fiscal 1997)

(Unit: tons/year)

Substance	*Airborne emissions (a)*	*Water-carried emissions (b)*	*Total volume of emissions (a)+(b)*	*Volume transferred (c)*	*Emissions + volume transferred (a)+(b)+(c)*
Xylene (types)	1,089.310	0	1,089.310	72.445	1,161.755
Toluene	606.800	0	606.800	21.827	628.627
Styrene	24.276	0	24.276	207.305	231.581
Trichloroethylene	8.245	0	8.245	13.155	21.400
Lead compounds	0.197	0	0.197	14.717	14.914
Chrome compounds (other than Hexavalent)	0.290	0	0.290	13.162	13.452
Dichloromethane	10.490	0	10.490	1.685	12.175
Aluminum compounds (soluble salts)	0	0	0	8.060	8.060
Ethylene glycol monoethyl ether	4.637	0	4.637	0.562	5.199
Zinc compounds	0.012	0.009	0.021	3.018	3.039
Others (20 substances)	4.454	0.163	4.617	7.650	12.267
Total (30 substances)	1,748.710	0.172	1,748.882	363.586	2,112.468

Status of chemical substance emissions and transfers