# Chemical Emission Reduction

Green Factories

## Implementing chemical emission reduction and an integrated management system

**Fujitsu has been working to reduce emission of such targeted chemicals as fluorine compounds, xylene and toluene from its manufacturing plants.*1 The methods adopted to achieve this target include reducing the amounts of the target substances employed, switching to substitute chemicals and restricting emissions in general. We are also implementing an integrated management system to handle chemical pollutants in accordance with the new PRTR*2 (Pollutant Release & Transfer Register) Law.**

*1: The manufacuturing plants are the Kawasaki, Oyama, Nasu, Nagano, Numazu, Kumagaya, Minami-Tama, Akashi, Kanuma, Suzaka, Iwate, Aizuwakamatsu and Mie plants.

## Reduction in Chemical Emission

Our goal for fiscal 2000 was to surpass our overall 20% reduction target with respect to the fiscal 1995 result by reducing emission by 3.4% relative to the previous year. The total volume of chemical emission*3 in fiscal 2000 was 38.8 tons, a year-on-year reduction of 9.8%. By the end of fiscal 2000, we had achieved a reduction relative to fiscal 1995 levels of 25.6% (13.3 tons equivalent ), thus substantially surpassing our original goal.

### Targeted Chemical Substances

- Fluorine compounds
- Toluene
- Manganese compounds
- Cadmium compounds
- Arsenic compounds
- Cyanide compounds
- Hydrazine derivatives
- 3,3-dichloro-4,4-diaminodiphenylmethane
- Xylene
- Nickel compounds
- Lead compounds
- Chromium compounds
- Bromine compounds
- Phosphine
- Phenols

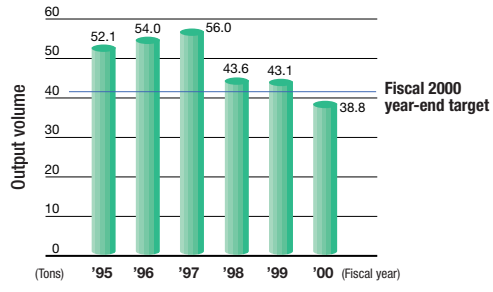
### Principal Chemical Emission Reduction Measures

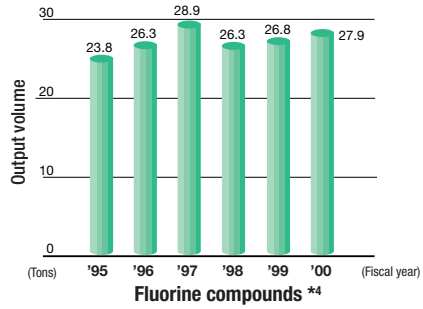
- Reduction of xylene emission by 4.4 tons at the Aizuwakamatsu Plant through improved performance of organic chemical waste processing equipment
- Cut in concentration of fluorine-containing acids in CVD (chemical vapor deposition) and diffusion processes at the Mie Plant by 50%
- Improvement of 5% in electrolytic regeneration equipment's permanganic acid resources recycling capacity at the Akashi Plant

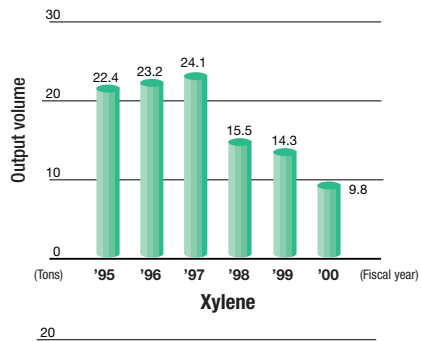
Improved organic chemical waste processing equipment (Aizuwakamatsu Plant)

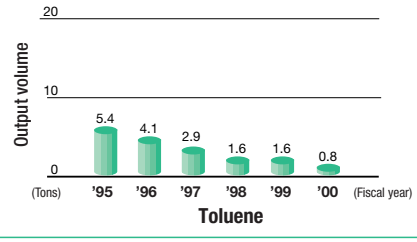
*3: Methods of calculating chemical emission reduction: Values are calculated by multiplying total volumes of effluent (fluorine, nickel, manganese and other compounds) or atmospheric emissions (xylene, toluene and other chemicals) by the concentrations of the relevant substances measured at the points of discharge from the site. Values for xylene, toluene and other chemicals, may also be based on the amounts of chemicals purchased and used.

### Reduction in Chemical Emission




*4: Despite efforts to reduce emission of fluorine compounds, increased production volumes resulted in higher emission in fiscal 1999 and 2000 than in fiscal 1998. In fiscal 2001, Fujitsu plans to achieve reductions in line with its emission reduction plans for specific chemicals from fiscal 2001 to fiscal 2003.

Please refer to page 49 for the definition of term *2.

## "We will reduce hazardous chemicals by optimizing every aspect of our manufacturing process"

"Treating nature as important and continually helping to create a better environment are key elements of our plant's environmental policy. In fiscal 2000, we succeeded in making substantial cuts in the amounts of hazardous chemical such as xylene and fluorine, measured per unit of production, we employ in semiconductor manufacturing. We achieved this by substituting a non-xylene-based chemical, altering some of our production process specifications and reconstructing our organic waste processing equipment. We have now reduced xylene emission by 75% relative to fiscal 1998 levels. We plan to continue taking this kind of proactive approach to making our plant as eco-friendly as possible."

*Yutaka Tabata General Manager, Aizuwakamatsu Plant*

## PRTR Law Compliance Measures

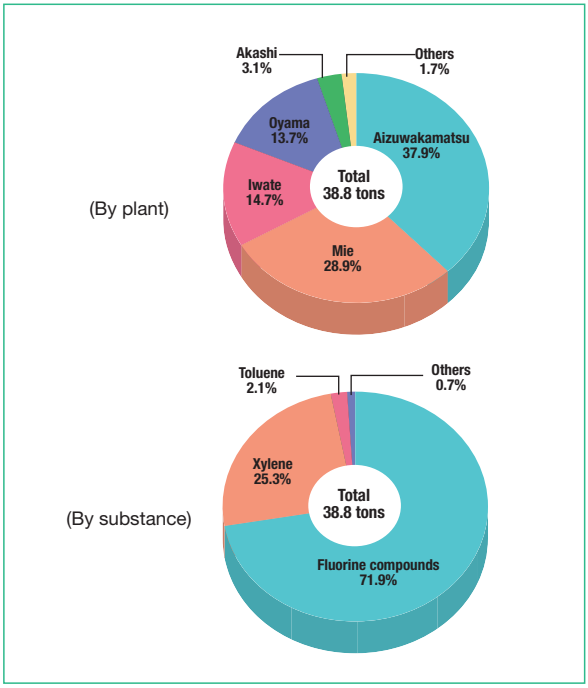
To achieve compliance with the PRTR (Pollutant Release & Transfer Register) Law enacted in Japan in March 2000, we implemented a new integrated intranet-based chemical management system*1 that manages chemicals from procurement to disposal and calculates chemical transfer and emission at 13 sites*2 in March 2001. Our total use of chemicals falling under the jurisdiction of the PRTR Law in fiscal 2000 was 762 tons. This figure represented a 14% reduction from fiscal 1999, a result achieved through our chemical reduction measures along with modifications of our data collection methods implemented to comply with the new legal standards.

We have also issued a separate report in accordance with the PRTR guidelines issued jointly by four organizations related to the electric and electronic appliance industries in Japan.

*1: A new integrated intranet-based chemical management system
Material safety data sheet registration and examination system
Registration and examination system for divisions using chemicals
Chemical balance management system responding to PRTR

*2: The 13 sites are the Kawasaki, Oyama, Nasu, Nagano, Numazu, Kumagaya, Minami-Tama, Akashi, Kanuma, Iwate, Aizuwakamatsu and Mie plants and the Akiruno Technology Center.

### Chemical Emission Volume (Fiscal 2000)




### PRTR Survey Results (Fiscal 2000)

(Fujitsu)

| Substances | Amount handled | Amount emitted or transferred | | | Volume of waste transferred | Amount consumed (product, etc.) | Amount disposed of | Amount recycled |
|---|---|---|---|---|---|---|---|---|
| | | Air emission | Water emission | Subtotal | | | | |
| Water-soluble copper salts (excepting complex salts) | 236.3 | 0 | 4.1 | 4.1 | 0 | 0 | 2.7 | 229.5 |
| 2-amino ethanol | 214.4 | 0 | 0 | 0 | 151.5 | 0 | 0 | 62.8 |
| Hydrogen fluoride and its water-soluble salts | 183.0 | 0.8 | 30.3 | 31.0 | 97.2 | 0 | 1.6 | 53.2 |
| Xylene | 86.5 | 8.8 | 0 | 8.8 | 77.5 | 0 | 0 | 0.1 |
| Formaldehyde | 15.5 | 0 | 0 | 0 | 10.5 | 0 | 5.0 | 0 |
| Nickel compounds | 7.3 | 0 | 0.5 | 0.5 | 6.8 | 0 | 0 | 0 |
| Lead and lead compounds | 5.8 | 0 | 0 | 0 | 0 | 0.3 | 0 | 5.5 |
| Pyrocatechol | 3.6 | 0 | 0 | 0 | 0 | 0 | 0 | 3.6 |
| Inorganic cyanide compounds (excepting complex salts and cyanates) | 2.6 | 0 | 0 | 0 | 2.6 | 0 | 0 | 0 |
| 2-ethoxyethyl acetate | 2.1 | 0 | 0 | 0 | 1.0 | 0 | 0.9 | 0.1 |
| Hydrazine | 2.0 | 0 | 0 | 0 | 0 | 0 | 2.0 | 0 |
| Ethylene glycol monoethyl ether | 1.6 | 0 | 0 | 0 | 1.6 | 0 | 0 | 0 |
| Ethylene glycol monomethyl ether | 1.2 | 0 | 0 | 0 | 1.2 | 0 | 0 | 0 |
| Total | 761.8 | 9.6 | 34.9 | 44.3 | 349.9 | 0.3 | 12.2 | 354.9 |

(Tons)

* The total differs slightly from the sums of the figures due to rounding off.
* The data shown here are total amounts summed up from the results totaled at each site.
* Fujitsu Media Device (Suzaka Plant) has been excluded.
* Amounts under 1 ton handled are excluded from the survey and summary.

### Principal Plans for Fiscal 2001

- Recycling of fluorine-containing acids by installing machinery at the Aizuwakamatsu Plant to recover those used in the CVD process and used as quartz tool cleaning agents
- Reconstruction of organic waste gas processing equipment at the Iwate Plant to boost the absorption ratio by a newly adopted recycling method