

# Chemical Emission Reduction

Targeting chemical substances used in manufacturing processes such as fluorine compounds, xylene and toluene, Fujitsu is working to reduce emissions of such chemicals by 20% from their actual fiscal 1995 levels by the end of fiscal 2000. Specifically, the company is trying to reduce the amount of substances employed, to use substitute chemicals, and to restrict emissions in general.

## Reductions in chemical emissions

The total volume of chemical emissions\*1 in fiscal 1999 amounted to 43.1 tons, 1% less than in the previous year and 17.3%, or 9.0 tons, lower than actual fiscal 1995 levels. Thus, by the end of fiscal 1999, a total reduction of more than 17% had been achieved.

### Targeted chemical substances:

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

### Principal chemical emission reduction measures

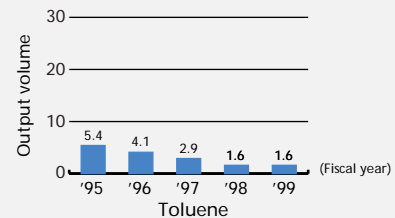
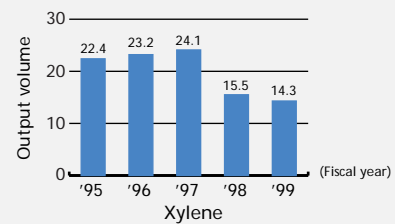
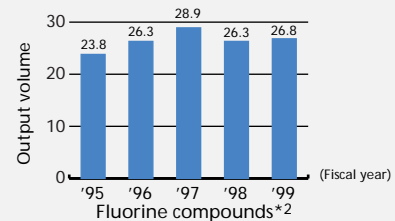
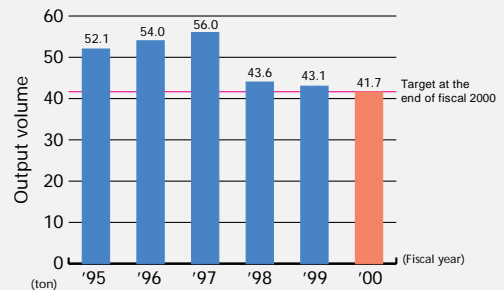
- Reuse of thinners (toluene/xylene) via introduction of solvent recovery equipment:  
..... Akashi Plant (emissions reduction: 1 ton)
- Elimination of toluene-containing chemicals:  
..... Mie Plant (emissions reduction: 0.2 tons)



Solvent recovery equipment (Akashi Plant)

\*1: Calculation methods for chemical emission reductions: Values are calculated by multiplying total volumes of effluent (for fluorine, nickel, manganese and other compounds) or atmospheric emissions (for xylene, toluene and other chemicals) by the concentrations of the relevant substances, which are measured at the point where the discharge from the site occurs. Alternatively, with xylene, toluene and other chemicals, values can be based on the amounts of chemicals purchased and used.

## Reductions in chemical emissions



\*2: With fluorine compounds, despite efforts to reduce emissions, higher production volumes meant that emissions in fiscal 1999 actually increased over the previous year. In fiscal 2000, Fujitsu plans to achieve reductions by improving waste liquid separation and recovery systems at its manufacturing plants.



**Comment**

Since 1995, we have been working at reducing emissions of chemicals used in the production processes for electronic devices. During fiscal 1999, we completed the switch from a toluene-containing cleaning agent used in the photomask process to another chemical that did not contain toluene. In doing so, we have reduced chemical emissions by 30% from their fiscal 1995 level. Now we are working on reducing emissions of fluorine compounds, which are used in processing wafer surfaces.



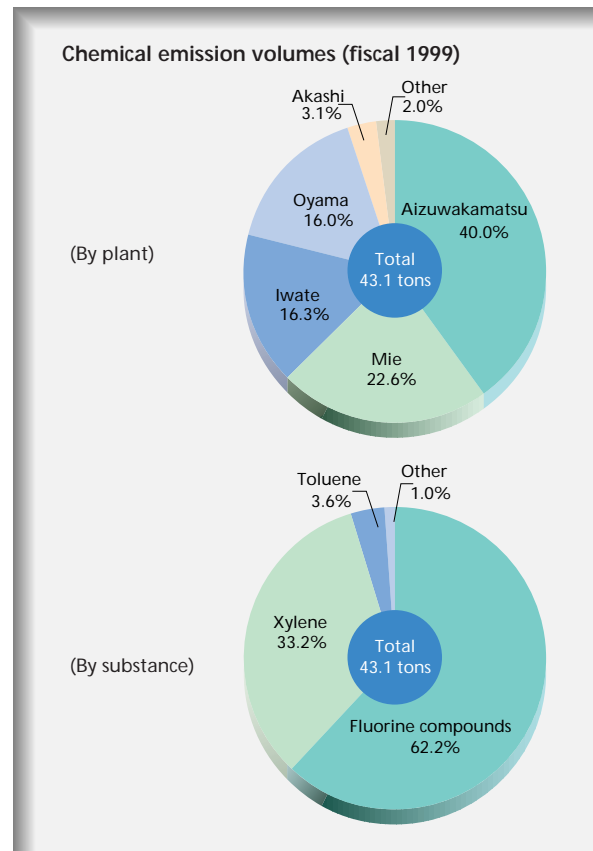
Yukio Kaneko  
General Manager, Mie Plant

**Principal plans for fiscal 2000**

- Reductions in xylene emissions through improved performance of processing equipment for organic chemical waste: Aizuwakamatsu Plant (projected emissions reduction: 1.6 tons)
- Improvements of electrolytic regeneration equipment for permanganic acid:  
..... Akashi Plant (projected emissions reduction: 0.01 tons)
- Substitution of sulfates for fluorine compounds used in coating processes:  
..... Kanuma Plant (projected emissions reduction: 0.04 tons)

**PRTR (Pollutant Release & Transfer Register) system**

Fujitsu has implemented a system based on the PRTR guidelines issued jointly by 5 organizations related to the electric and electronic appliance industries in Japan. The PRTR system aims to reduce the emissions of chemical substances that could be harmful to the environment—specifically, by causing air or water pollution—by requiring companies to report the amounts of substances being released. This system also enables Fujitsu to comply with the provisions of Japanese legislation, enacted in March 2000, that governs the release of specified substances into the environment and any improvements made to the handling of such processes. In line with both of these initiatives, in October 2000 Fujitsu began implementing an integrated intranet-based management system\*3 for potentially harmful chemical substances at all of its domestic manufacturing and related operations (11 plants, including the Kawasaki Plant, plus Fujitsu Laboratories, Ltd.). This system ensures the proper management of such chemicals from purchase through to final disposal, while also monitoring and measuring the amounts of any chemicals that are transferred or emitted. \*3: (see page 37)



**PRTR survey results (Fiscal 1998)**

(Fujitsu)

Name of chemical	Amount handled	Amount emitted or transferred				Amount consumed (of product, etc.)	Amounts disposed of	Amount recycled
		Air emissions	Water emissions	Amount of waste transferred	Subtotal			
Hydrogen chloride (excepting hydrochloric acid)	0.2	0.05	0	0.09	0.14	0	0.06	0
Chlorine	1.43	0	0	0.27	0.27	0	1.16	0
Xylene compounds	121.19	17.03	0	63.22	80.25	0	0	40.87
Cyanide compounds	2.59	0	0	1.99	1.99	0	0.6	0
N,N-dimethylformamide (DMF)	2.14	0	0	2.14	2.14	0	0	0
Copper compounds	197.46	0	0.39	0	0.39	0	2.01	195.06
Toluene	7.42	1.51	0	5.92	7.42	0	0	0
Lead compounds	7.61	0	0.02	0	0.02	0	0	7.59
Nickel compounds	6.51	0	0.61	0	0.61	0.41	0	5.49
Hydrazine	2.36	0	0	0	0	0	2.36	0
Hydrogen fluoride	141.71	0.6	15.66	35.45	51.71	0	67.59	22.41
Fluorine compounds (inorganic)	13.68	0	2.88	10.47	13.35	0	0.3	0.03
Formaldehyde	21.46	0	0.06	10.34	10.4	0	11.06	0
Manganese compounds	4	0	0.02	3.98	4	0	0	0
Aluminum compounds (soluble chloride salts)	403.37	0	0	0	0	0	403.37	0
Monoethanolamine (MEA)	96.21	0	0	96.21	96.21	0	0	0
2-ethoxyethyl acetate	2.36	0	0	2.36	2.36	0	0	0
<b>Total *4</b>	<b>1031.7</b>	<b>19.18</b>	<b>19.64</b>	<b>232.43</b>	<b>271.26</b>	<b>0.41</b>	<b>488.51</b>	<b>271.45</b>

\*4: Total is slightly different, because items are rounded off.

(tons)