

Addressing Environmental Preservation through Our Business Activities

Measures to Control Soil and Groundwater Contamination

Elimination of trichloroethylene and the like

In 1983, the Environment Agency (currently the Ministry of the Environment) first identified chlorinated organic solvents such as trichloroethylene as potentially carcinogenic. Recognizing this as an important issue, Murata began taking steps toward eliminating the use of chlorinated organic solvents such as trichloroethylene. By the time groundwater permeation was prohibited according to the terms of the 1989 Water Pollution Prevention Law, 17 of Murata's 22 production plants and subsidiaries had ceased using trichloroethylene. Furthermore, by 1995, four of the remaining five plants had eliminated the use of chlorinated organic solvents, with the remaining plant continuing use of such solvents because of the product preferences of a particular large customer. By March 1998, however, use of such solvents had been eliminated throughout the company. We can boast that, among all companies using chlorinated organic solvents, our achievement was exceptionally rapid.

In 1991, in parallel with this countermeasure, Murata introduced up-to-date technology that enabled the Company to undertake a factual survey of soil and groundwater contamination in all plants.

As a result of this effort, it was concluded that 14 of the Company's 36 plants and subsidiaries had to institute remediation measures to remove contamination by chlorinated organic solvents.

Implementing early-stage remediation (decontamination) countermeasures

We have instituted purification facilities on polluted sites and, wherever it was deemed necessary as part of the cleanup operation, we drilled wells along the borders of the sites of plants and subsidiaries. We have also prevented the spread of contamination beyond the sites by actively cleaning polluted soil and groundwater by means of strong vacuum extraction and the activated carbon absorption process*¹ and by the water pumping, aeration, and activated carbon absorption process.*²

Regarding our prior use of chlorinated organic solvents, we sought to document the results of our survey and countermeasures. Thus, since 1991, we have undertaken detailed soil and groundwater pollution surveys and have instituted a voluntary response. The survey and cleanup measures adopted by Murata are implemented with the most advanced technologies available. Furthermore, we reported our progress to the government and ceased submission of government reports in 1998.

Preventing the migration of pollution beyond plant sites

Table 1 shows the state of progress of the cleanup. One plant (Toyama Murata) has completed its cleanup, while 13 plants are continuing with their cleanup operations. Each plant is remediated by concentrating the local pollutants in wells drilled along the border of the site. As a result, we believe that this approach currently prevents any pollution from migrating beyond the plant sites. Moreover, two plants (the Fukui Murata Takefu Plant and Kanazu Murata Kanazu Plant) have already satisfied the environmental standard, and these plants are preparing to conclude their remediation operations.

Allocating reserves to cover all remediation (decontamination) costs

Completion of all remediation (decontamination) measures entails very high countermeasure costs. For business accounting purposes, Murata has completed a trial calculation of the full cost of remediation measures to ensure all contamination has been removed. As a result, we have appropriated a reserve as a credit (Table 2).

Table 1. State of groundwater remediation

(mg/ℓ)

Plants and Subsidiaries	Substance (Environment Standard Value)	Trichloroethylene (0.03 max.)	Cis-dichloroethylene (0.04 max.)	Remarks
Murata Manufacturing Co., Ltd., Head Office, Nagaoka Plant		0.349	0.011	
Fukui Murata Manufacturing Co., Ltd., Takefu Plant		0.015		Preparing for completion of cleanup
Fukui Murata Manufacturing Co., Ltd., Shirayama Plant		2.249	0.460	
Fukui Murata Manufacturing Co., Ltd., Miyazaki Plant		1.127	0.212	
Asuwa Electronics Industries, Ltd.		0.436	4.125	
Iwami Murata Manufacturing Co., Ltd.		0.140	1.964	
Wakura Murata Manufacturing Co., Ltd.		N.D.		
Himi Murata Manufacturing Co., Ltd.		N.D.	N.D.	
Kanazu Murata Manufacturing Co., Ltd., Kanazu Plant		N.D.		Preparing for completion of cleanup
Kanazu Murata Manufacturing Co., Ltd., Natsume Plant		0.203	0.109	
Hakui Murata Manufacturing Co., Ltd.		0.061	0.187	
Hakui Murata Manufacturing Co., Ltd., Togi Plant		0.242	0.379	
Toyama Murata Manufacturing Co., Ltd.		N.D.		Cleanup completed
Murata Electronics North America State College Operation		Trichloroethylene (0.005 max.)	Cis-1,2-dichloroethylene (0.07 max.)	
		0.013	0.014	

1) Data are average values from April 2001 to March 2002.

2) Data show the average values for downstream groundwater in all wells drilled along the border of a site.

3) We established the apprehended area in order to prevent migration of pollutants beyond the site, and are undertaking remediation efforts.

4) "Not detectable" means the measured quantity is below the lower limit of detection.

5) The diagonal line indicates that the site is deemed free from contamination.

Table 2. Cost of soil and groundwater remediation

(Millions of yen)

Total for FY1991-FY2001		Estimate for FY2002 and later		Total	
Nonconsolidated	Consolidated	Nonconsolidated	Consolidated	Nonconsolidated	Consolidated
754	6,109	208	4,810	962	10,919

Note: Amount allocated as a reserve credit is the result of a trial calculation of the full cost of remediation measures, up to completion of the contamination cleanup.

Thorough prevention of groundwater and soil contamination

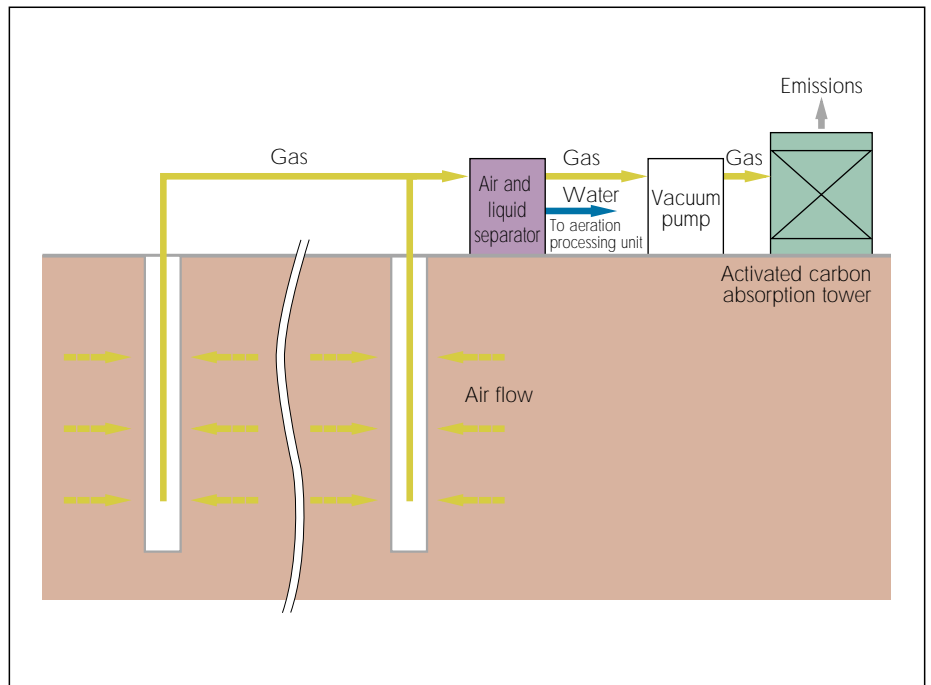
Beginning in 1995, Murata established a voluntary standard for preventing ground permeation. As a result, we are taking steps to avoid ground permeation by any and all chemical substances. To ensure compliance with our voluntary standard for ground permeation prevention, we are implementing the measures stated at right. These measures have been concluded everywhere during fiscal 2001, except in some parts of some plants. [See page 12.](#)

Tanks containing chemical substances shall be double-walled and installed above ground, fluid control banks shall be installed, and leakage control coatings shall be applied.

All forms of conveyance for chemicals, drainage from production processes and wastewater treatment equipment shall be double-walled and installed above ground.

*1. Strong vacuum extraction and activated carbon absorption process

A well drilled for remediation of a contaminated area is decompressed with the installation of a vacuum pump. Any chlorinated organic solvents in the soil are extracted by means of gasification. The recovered gas is processed by means of absorption with activated charcoal.



*2. Water pumping, aeration and activated carbon absorption process

Groundwater is pumped up with a pump installed in a well used for remediation of a contaminated area. The recovered water is aerated and the chlorinated organic solvent is isolated by means of gasification. The treated water is discharged into the sewerage or a river when the contaminant has been reduced to less than one-half the environmental standard. The gasified chlorinated organic solvent is processed by means of absorption with activated charcoal.

