

Although chemical substances are indispensable in our daily lives, they can have a grave effect on the environment without proper control. Oki Electric is well aware of this fact and is therefore striving to limit the use of chemical substances.

Chemical Substance Control

Chemical substances used in manufacturing and included in products that have a great environmental impact are designated and are managed under the

classification of prohibited substances, suppressed substances and voluntarily controlled substances.

Chemical Substance Control

Classification		Number of substance types	Identification standard	Control method
Prohibited substances	Production activity	88	<ul style="list-style-type: none"> ●Substances prohibited for manufacturing by laws and regulations ●Substances which require manufacturing licensing by laws and regulations ●Voluntarily prohibited substances ●Others 	Prohibiting use in production activities and prohibiting inclusion in any products
	Products	90		
Suppressed substances	Production activity	91	<ul style="list-style-type: none"> ●Substances for which a reduction in use has been determined by laws and regulations (manufacturing prohibition period, etc.) ●Voluntarily suppressed substances 	<ul style="list-style-type: none"> ●Understanding of amounts used and contained ●Establishment and promotion of reduction schedule
	Products	93		
Voluntarily controlled substances	Production activity	390	<ul style="list-style-type: none"> ●All substances that are not included in categories of "prohibited substances" and "suppressed substances." 	<ul style="list-style-type: none"> ●Understanding of amounts used and contained
	Products	102		

Reduction of Substances Applicable for PRTR

The Pollutant Release and Transfer Register (PRTR) system is available as a means for understanding the discharge status of substances that present a great environmental impact. A law concerning the execution of the PRTR system was proclaimed in July 1999 and the first reporting based on this law started in April 2002.

Oki Electric commenced activities to engage in the

PRTR system in 1997 prior to the enactment of this law, in accordance with the guidelines provided by the Electrical and Electronics Industry Association. The discharge of PRTR designated substances was reduced by 29% in 2001 when compared to that of 2000.

2001 Records of PRTR Activities

(tons)

Chemical substance name	Usage quantity	Discharged amount				Transfer amount	
		Release to atmosphere	Release to public water	Release to ground	Total	Amount transferred as waste materials	Amount transferred to sewage
Hydrogen fluoride and its compounds	103.51	0.36	0.40	0	0.76	35.50	0.02
Xylene derivatives	36.29	8.38	0	0	8.38	27.91	0
2-amino ethanol	18.39	3.31	0	0	3.31	15.08	0
Formaldehyde	8.17	0	0	0	0	1.37	0
Water-soluble copper salt (excluding complex salts)	4.03	0	0	0	0	0.25	0
Toluene	3.57	2.45	0	0	2.45	1.12	0
1-1-dichloro-1-fluoroethane	3.30	3.30	0	0	3.30	0	0
N-N-dimethylformamide	3.28	0.59	0	0	0.59	2.69	0
Nickel compounds	3.02	0	0	0	0	0.71	0
Lead and lead compounds	2.96	0	0	0	0	0	0
Pyrocatechol	2.29	0.41	0	0	0.41	1.88	0
2-ethoxy ethyl acetate	1.57	0.26	0	0	0.28	1.29	0
Monoethanolamine	1.19	0.21	0	0	0.21	0.98	0
2001 total	191.57	19.29	0.40	0	19.69	88.78	0.02
2000 total	283.20	27.10	0.63	0	27.73	92.91	0.03

Reduction of chemical substances included in products that have an environmental impact

Chemical substances included in materials and parts that comprise products must be reduced in order to lower the chemical substances that have an environmental impact.

Oki Electric is promoting a reduction of these chemical substances by replacing parts and materials that have an environmental impact with non-impacting parts and materials.

Examples of reduction in environmentally impacting chemical substances included in parts and materials

Name of chemical substance	Parts/materials containing this substance	2001 activity results
Polyvinyl chloride (PVC)	Telephone cables	Evaluation of switching to alternative cables completed.
	PVC coating for metal parts	Switching to polyester coatings.
	PVC steel sheets	Switching to polyolefin steel sheets.
Sexivalent chrome	Chromate treated steel sheets	Evaluation of switching to alternative steel sheets completed.
Lead	Solder	Lead-free solder is being evaluated, and has been applied to some products.

Establishing a mass production system for printed circuit boards containing lead-free solder

Ordinary electronic products contain components using lead solder that is used to solder LSI pins to a printed circuit board. When such products are disposed of, the toxic lead contained in the solder is often dissolved by acid rain, and spills out into the environment. Studies have been conducted concerning the application of solders that do not contain lead (lead-free solder). In 2001, Nagano Oki Electric succeeded in establishing a mass production system for printed circuit boards with lead-free solder.

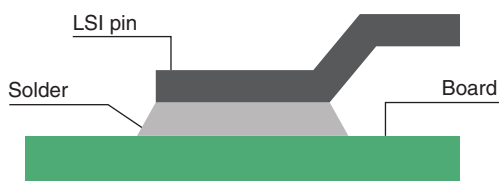
By 2000, Nagano Oki Electric completed the implementation of reflow soldering (shown in Figure 1) equipment used primarily for surface mounting. In 2001, the company newly introduced flow soldering equipment (shown in Figure 2), completing the establishment of an overall mass production system.

Tin (Sn), silver (Ag), and copper (Cu) based materials were adopted as material components of the lead-free solder, which are the key components for promoting the elimination of lead in solders, based on material evaluation and mounting reliability evaluation. These Sn-, Ag-, and Cu-based materials have a melting point about 30°C higher than that of the conventional solder materials, which influences the thermal resistance characteristics of parts and printed circuit boards. Their use has been made possible through the implementation of ovens that



provide a uniform internal temperature and by establishing a soldering technology in a nitrogen environment. Oki Electric is planning to totally eliminate lead-containing solders for all domestically manufactured products by the end of 2003.

(Figure 1) An example of reflow soldering



(Figure 2) An example of flow soldering

