### Manufacturing Environmentally Conscious Products



We deliver more than 300,000 environmentally conscious products to our customers around the world.

# International Chemical Regulations becoming Stricter

In today's society, various chemical substances are used in diverse ways, and play indispensable roles in our daily lives. On the other hand, some chemical substances may adversely affect the human health and ecosystems. In regard to these hazardous chemical substances, there is a growing trend to regulate not only their use and emissions at factories, but also their use in electric and electronic devices sold on the market. This is exemplified by the Restriction of Hazardous Substances in Electrical and Electronic Equipment Directive (the "RoHS Directive")\*1, which went into effect in July 2006 in Europe. The RoHS Directive seeks to limit the amount of hazardous substances contained in new electrical and electronic equipment.

## Completion of Measures to Comply with the RoHS Directive

In 1996, Murata formulated the "Voluntary Regulation Program for Environmentally Hazardous Substances," to establish its voluntary regulation standards. Since then, Murata has worked to reduce and eventually eliminate environmentally hazardous substances contained in its products, ahead of other manufacturers. Our voluntary regulation program also covers six substances designated under the RoHS Directive. We have thus undertaken measures to phase out RoHS-designated substances from an early stage.

As for mercury, cadmium and specific brominebased flame retardants, Murata had already discontinued their use in its products in the 1990s, and has prohibited new uses of these substances. We also had to eliminate the use of lead in terminals and other component connections. Lead-free solder requires a higher melting temperature and less solderability than conventional solder containing lead. Due to these technological problems, lead-free solder is difficult to use. To address any problems, Murata has reviewed product designs, modified existing production facilities, improved processing conditions and introduced new machinery, in addition to various other measures. Through such efforts, by the end of 2004 we were able to prepare alternative for RoHS-designated substances. Moreover, in cooperation with our customers/ suppliers, in January 2006 we terminated, as a rule, the sale of products not in compliance with the RoHS Directive\*2.

# Further Reduction of Environmental Impact

Although Murata has completed its conversion to RoHS-compliant products, the Directive regulates only six substances, some applications of which are exempted from the Directive due to difficulty in finding alternative substances. Murata considers that compliance with the RoHS Directive is not a goal, but rather a transition point for us. We therefore set ambitious targets also for substances and applications that are not subject to the RoHS Directive, so as to systematically implement







Solder bath for lead-free wave soldering



RoHS-compliant products

- \*1 Refers to Restrictions on Use of Certain Hazardous Substances in Electrical and Electronic Equipment (2002/95/EC) and its amended version, implemented in Europe. The RoHS Directive prohibits the use of lead, mercury, cadmium, hexavalent chromium and specific bromine-based flame retardants (PBB, PBDE) in EEE (excepting exemptions and naturally occurring impurities). "RoHS compliant" designates a status of compliance with the above restrictions.
- \*2 Excluding when these products are supplied at the customer's request.
- \*3 General term for bromine-based flame retardants and chlorinebased flame retardants

initiatives for reducing and minimizing environmental impact.

Taking lead as an example, its application is exempted from the RoHS Directive when used in certain ceramics employed for resonators and ceramic filters, and in glass used in some electrode and insulating materials. This is because no effective alternative substances and technologies are presently available. To address this lack, Murata is working to develop lead-free ceramic materials and electrical conducting/insulating materials, taking advantage of the Company's strength in materials development for electronic components.

Moreover, under the RoHS Directive, halogenated flame retardant\*3 regulations apply only to PBB/PBDE, which may generate dioxins during combustion. Other halogenated flame retardants used in printed circuit boards and plastics are also considered to pose risk of dioxin generation when burned. Murata is therefore active reducing its use of halogenated flame retardants and in replacing them with alternative substances.

In addition to the above activities, we are planning to reduce and eventually eliminate the use of inorganic compounds and polyvinyl chlorides (PVCs). Under existing legislation, their use is not restricted, though their management is required. However, in line with our voluntary standards, we will gradually reduce and eliminate these substances, beginning with those having relatively high environmental impact.

<u>Voice</u>



Members of Subcommittee for Regulated Substances Management

#### We are quick to comply with regulations and directives in advance of their enforcement

In 2006, the RoHS Directive came into effect in Europe. In the future, other regulations and directives, including REACH in Europe, are planned to implementation. To comply with these new regulations and directives, we are gathering relevant information in the development stage, so that Murata's in-house regulations will cover new legislation in advance of its enforcement.

Whenever these regulations and directives are newly instituted or amended, we must swiftly check the specified substances contained in our products and, if necessary, begin developing or procuring alternative substances. To this end, we have compiled a database on substances used in Murata products and their contents, and materials purchased, enabling timely and appropriate response.