

Product-Related Initiatives for the Environment

We take a variety of measures to reduce our environmental impact, including the provision of energy-saving production equipment and reductions in the use of regulated chemical substances.

Our Approach to Reducing the Environmental Impact of Our Products

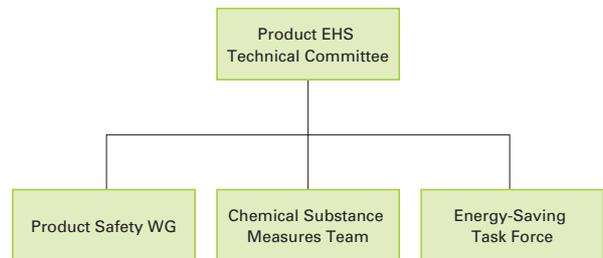
We believe it is extremely important to promote environment-conscious designs, as we have clearly stated in the revised Tokyo Electron Group Credo and Principles on Environmental Preservation. We give priority to the provision of energy-saving equipment and to reducing or finding substitutes for the regulated chemical substances contained in our products.

Organization for Reducing Environmental Impact

We have three units established under the Product EHS Technical Committee. The Product Safety Working Group is responsible for conducting activities to improve product safety. The Chemical Substance Measures Team is responsible for reducing and finding substitutes for regulated chemical substances contained in equipment parts and components. The Energy-Saving Task Force, which was founded in October 2005, is responsible for implementing measures to improve the energy efficiency of our products.

Recently, there are increasing expectations from various quarters for us to continue our environmental, health and safety (EHS) measures. Accordingly, it is becoming more and more important for us to design and develop products that incorporate EHS. In accordance with the globalization of our business, we also need to pay more attention to the legal regulations of each of the countries we do business in. We will continue to promote "Design for EHS."

Organizational Structure to Promote EHS Measures for Products



TOPICS

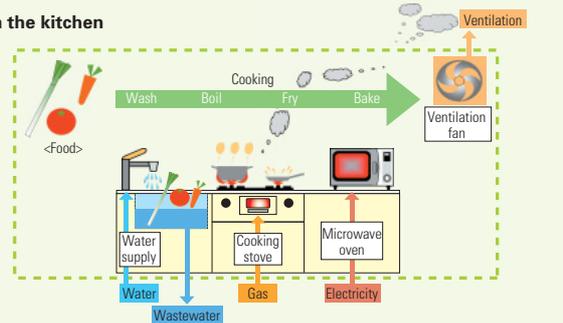
Calculating the Energy Used by Semiconductor Production Equipment: SEMI S23

We have traditionally measured and calculated the electricity consumed by the equipment itself. However, semiconductor production equipment uses a range of resources, including water, dry air, and cooling water, and generates waste heat, and its peripheral devices (vacuum pumps and cooling equipment) also consume energy. The type of energy used also differs with the equipment type. In view of this, SEMI established the S23 Guide for Conservation of Energy, Utilities and Materials Used by Semiconductor Manufacturing Equipment. We now calculate the electricity consumed by our products comprehensively by using appropriate energy coefficients in compliance with the Guide.

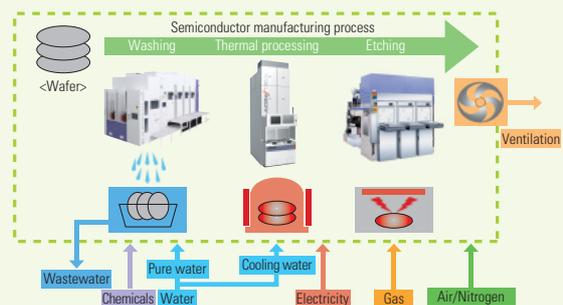
The Tokyo Electron Group took the initiative and played a central role in the formulation of the Guide. Its Energy-Saving Task Force calculates the energy consumed by each product based on the Guide. The figures on the right compare how energy is used in the kitchen (upper right) and by semiconductor production equipment (lower right).

Various Energy Sources Used at Different Stages

● In the kitchen



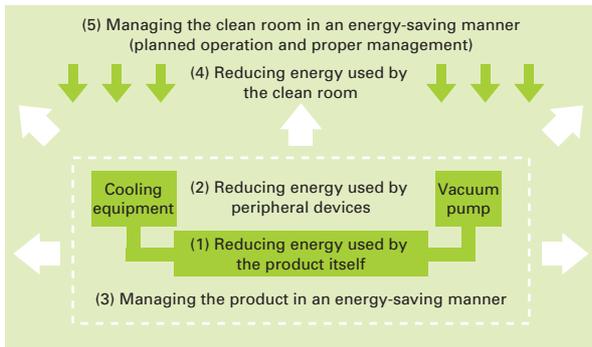
● By semiconductor production equipment



Energy-Saving Measures for Products

To reduce the energy that our products consume when they are used by our customers, we are examining measures to achieve the following five targets and will develop the necessary technologies: (1) reducing energy used by the product itself; (2) reducing energy used by peripheral devices; (3) managing the product in an energy-saving manner; (4) reducing energy used by the clean room; and (5) managing the clean room in an energy-saving manner (planned operation and proper management). For energy-saving management of the clean room, we will cooperate closely with customers and the manufacturers of clean rooms. In addition, we will identify how much energy our products consume in reference to the SEMI S23 Guide and implement the necessary measures.

Approach to Energy Saving



Energy-Saving Examples

We implement energy saving for each of our products according to the types of energy sources used and the amount of energy consumed.

Example 1. Reducing the amount of nitrogen gas used by the thermal processing system

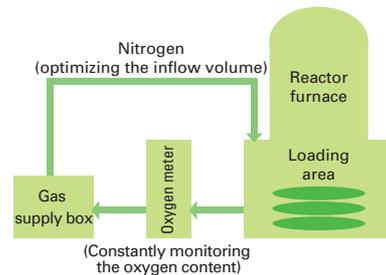
In the loading area of the thermal processing system, where wafers are loaded for input into the reactor furnace, the oxygen content is kept at a low level by injecting nitrogen to prevent the surface of the wafer from oxidizing naturally. In the previous model, the inflow volume of nitrogen was kept at a certain level, but for TELINDY™, we have made it possible to constantly monitor the oxygen content in the loading area to control it,



TELINDY

and so we can optimize the inflow volume of nitrogen according to the oxygen content at each of the wafer processing stages. This has enabled us to reduce the use of nitrogen by approximately 60% compared with the amount used by the previous model.

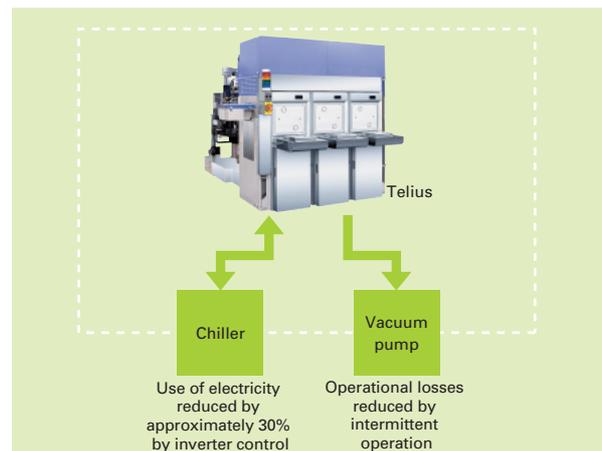
Reducing the amount of nitrogen used by the thermal processing system



Example 2. Reducing the amount of energy used by peripheral devices for the Plasma Etch System

Our Telius™, a plasma etch system, uses a lot of energy for the chiller (the device that cools the refrigerant and the inside of the system) and for peripheral devices such as the vacuum pump, which maintains a vacuum in the chamber. We implemented measures to reduce energy used by these peripheral devices. By controlling the chiller with an inverter, we reduced the use of electricity by 30%. Also, we eliminated energy waste by operating the vacuum pump intermittently according to the operational status of the system.

Reducing energy used by peripheral devices in the Plasma Etch System



Product-Related Initiatives for the Environment

Our Commitment to Reducing the Use of Regulated Chemical Substances in Products

Against the backdrop of growing concerns over the impact that harmful substances contained in parts and materials have on the environment and ecosystem, an increasing number of countries are regulating the use of these substances in automobiles and electrical products in recent years. In particular, the WEEE¹ and RoHS² directives implemented in Europe and China's RoHS³ are attracting much attention from related industries. These directives have a considerable influence on the products of the Tokyo Electron Group, and we have started reducing the use of regulated chemical substances in our products to meet the requirements of the directives even before they are actually implemented.

The RoHS directive is applied to products put on sale in Europe in or after July 2006, and the use of the following six chemical substances in products is prohibited: lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyls ether (PBDE). China's RoHS, which is scheduled to come into force in March 2007, also prohibits the use of these six substances. Accordingly, we have decided to give priority to discontinuing the use of these substances, as shown in the table below.

1. WEEE: Waste Electrical and Electronic Equipment
2. RoHS: Restriction on the use of certain hazardous substances in electrical and electronic equipment
3. China's RoHS: Officially called "Management Methods for the Prevention and Control of Pollution from Electronics Information Products"

Chemical Substances to Be Reduced

First Priority

Cadmium	Pigments, stabilizers, and resins
Hexavalent chromium	Chrome plating
Lead	Solders, paints, electrical wire coating, and free-cutting metal
Mercury	Batteries and fluorescent lamps
PBBs	Resin parts
PBDEs	Resin parts

Second Priority

Substances designated as Level A substances in JIG*
(We have already implemented measures for many of these substances.)

* Joint Industry Guide for Material Composition Declaration for Electronic Products (JIG) was prepared by Japanese, American, and European private trade associations and this Guide lists the chemical substances for which measures should be implemented. The Guide classifies the substances into Level A and Level B: 16 substances are listed as Level A substances, including cadmium, hexavalent chromium, lead, mercury, PBBs, and PBDEs, and more than 400 substances are listed as Level B substances.

System to Reduce the Use of Regulated Chemical Substances

The Tokyo Electron Group's Chemical Substance Measures Team is responsible for reducing the use of regulated chemical substances. The team comprises representatives from TEL's headquarters and its

manufacturing subsidiaries. We share relevant information through this team and are asking our suppliers to cooperate with us in replacing parts and materials that contain regulated chemical substances with alternatives that do not contain them. Two of our manufacturing subsidiaries have also founded special teams to implement measures for regulated chemical substances. These special teams decide the implementation schedule and roles to be shared by each department and individuals, and conduct regular reviews to ensure that the measures are implemented without delay. The Chemical Substance Measures Team discusses any problems that are difficult to improve or solve through the special teams alone, and identifies the measures that can be implemented.

Survey on the Use of Regulated Chemical Substances

We surveyed the use of regulated chemical substances targeting approximately one million registered parts, using the JGPSSI Format, which is an industry standard format.

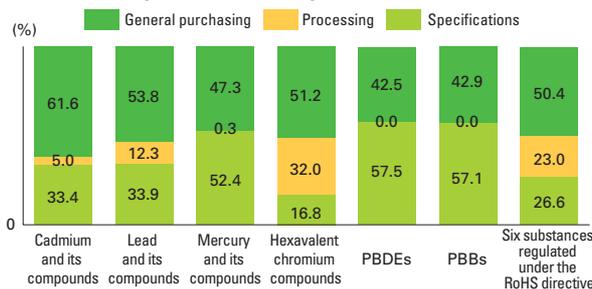
JGPSSI Format

A survey conducted at Tokyo Electron AT, one of the manufacturing subsidiaries of TEL, has revealed that regulated chemical substances are contained in the following parts:

- Lead and its compounds: Solder used for circuit boards and components
- Hexavalent chromium compounds: Coating of terminal blocks
- Cadmium and its compounds: Connectors and joints

Based on the survey results, we are continuing to educate employees and suppliers on the importance of reducing the use of these substances and sharing relevant information with them with a

Results of Survey Conducted at Tokyo Electron AT (June 1, 2006)



view to introducing alternative replacement parts and materials that do not contain these regulated chemical substances. All of our departments, including those in charge of development, design, manufacturing, materials, quality assurance, and safety and the environment, are making concerted efforts to achieve the goal.

Lead-free Initiatives

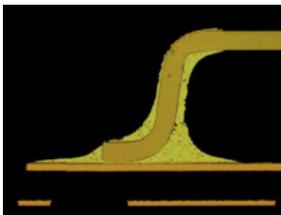
We started to implement measures to discontinue the use of lead in our products before taking measures for other regulated chemical substances.

The Tokyo Electron Group's products are equipped with a variety of complex electronic circuit boards for advanced control functions, and with cables and harnesses that supply power to and exchange information with the boards. We use solder to connect these components electrically. In replacing lead solder with lead-free solder, it is necessary to evaluate the reliability of alternative materials from multiple aspects, and it is especially important to ensure that the alternatives connect the components electrically in a proper manner.

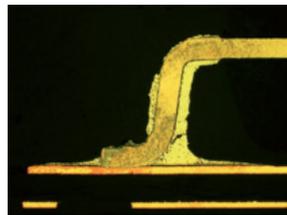
In FY 2006, we started to adopt lead-free solder after examining the reliability test results, especially focusing on the reliability of the electrical connection. As a result of the examination, we were assured that lead-free solder is just as reliable as lead solder.

In the examination, we conducted a temperature cycle test to study the impact of thermal changes on parts. We checked how the outer appearances, electrical functions, and adherence of the soldered parts were influenced by these changes, and examined cross-sections of soldered parts. In the temperature cycle test, we repeated the cycle 1,000 times to simulate over 20 years of use.

Photos Showing Cross-sections of Soldered Parts (after 1,000 cycles)

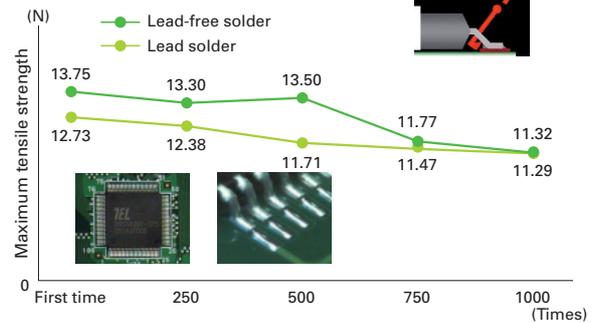


Lead-free solder

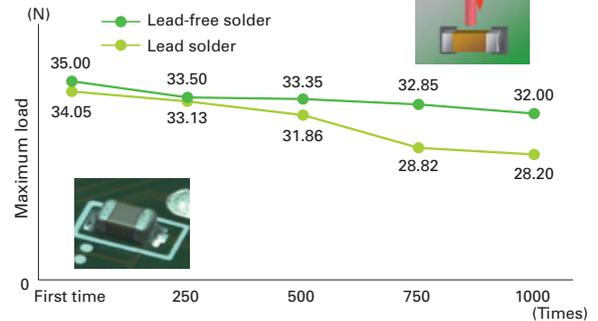


Lead solder

Tensile Strength Test on Soldered Parts



Shear Test on Soldered Parts



In January 2005, we started to use lead-free solder for cables and harnesses on our CLEAN TRACK™ LITHIUS™, which is our major coater/developer for immersion lithography. Subsequently, in March 2006, we adopted lead-free electronic control circuit boards. The changeover to lead-free cables and boards has also been implemented for other products manufactured by Tokyo Electron Group companies, including thermal processing systems, plasma etch systems, surface preparation systems, and wafer probers.

In ever-closer cooperation with its suppliers, the Group will implement measures to discontinue the use of lead in diverse parts and materials, such as glass and resin parts, as a part of its efforts to reduce the use of regulated chemical substances, thereby making its products even more environmentally friendly.



CLEAN TRACK LITHIUS

Product-Related Initiatives for the Environment

Asbestos

We checked the use of asbestos in all our products. As a result, it was revealed that asbestos was used in power cables for thermal processing systems produced in or before April 1985. We notified this fact to the users of these systems in July 2005. We then measured the amount of asbestos in the air on the site with the users' consent and confirmed that the asbestos does not spread into the air as long as the cables are used and maintained in a proper manner. We therefore reported to our users that the cables containing asbestos pose no threat to their health.

We also asked employees, including retirees, engaged in the manufacture of these cables to undergo medical checkups, and all of them had been through a checkup by the end of March 2006. According to the results, none of them have health problems caused by asbestos. However, we intend to give them medical

checkups on a continuing basis.

We checked the use of asbestos in all our parts as well. Some gaskets and sealing materials used in some OEM products contained asbestos, but we confirmed that the asbestos does not easily spread into the air and will not cause any health risks as long as the parts containing it are used and maintained in a proper manner. The use of asbestos in these parts is not regulated under Japan's domestic laws. However, we discontinued the use of these parts starting with the products scheduled to be shipped in or after January 2006.

We also checked the use of asbestos in our plant and office buildings and confirmed that none of the buildings contained sprayed asbestos that can easily spread into the air. When renovating or demolishing parts of buildings that might contain asbestos, we take drastic measures to ensure that it does not easily spread into the air.

TOPICS

TELFORMULA™ Wins the Prize for Excellence from Japan's Ministry of Economy, Trade and Industry

In August 2005, we received the Prize for Excellence for our semiconductor thermal processing system TELFORMULA from the Ministry of Economy, Trade and Industry at the first award competition held by the Ministry to encourage manufacturers to pass on and continue to develop Japanese manufacturing skills that support Japan's industry and culture. The Ministry pronounced that we had developed a product that enables highly productive and high-quality thermal processing.

TELFORMULA has the following features: (1) a cycle time that has been shortened to one-fourth compared with the previous model; and (2) introduction of new technology to clean the equipment using gas, whereas in the previous model you had to detach the reactor tube from the equipment to wash it in a liquid agent. Because of these features, the major semiconductor manufacturers of the world have chosen this equipment for their semiconductor manufacturing lines.



Certificate of Commendation granted by the Ministry



TELFORMULA

New Features of TELFORMULA

1. Shortened heating time

The quartz reactor tube, where thin insulating films are formed on wafers, needs to be kept at a high temperature with a temperature variation within ± 1 degree Centigrade. With TELFORMULA, which adopts a newly-developed heater, the time required for heating is reduced to one-fourth compared with the previous model.

2. Shortened film forming time

It is necessary to reduce the internal pressure when thin films are formed inside the reactor tube. By adopting a new, rapid ventilation valve, we have reduced the time required for this to approximately one-fifth compared with the previous model.

3. Shortened wafer delivery time

With TELFORMULA, wafers are delivered to and removed from the reactor tube using an automatic wafer transporter at high speed and within a short time without any damage to wafers from vibration. The delivery time, which was 18 minutes for the previous model, has been shortened to only one minute.

Environmental Considerations

In the thermal processing process, the equipment has to wait until the next wafer is delivered to it. In the past, if the equipment was turned off during this wait time, it would take time to heat up to the correct temperature, which meant lower productivity. However, you can turn off TELFORMULA during the wait time because it can soon be reheated to the correct temperature. As a result, you can save approximately 20 kWh of energy per hour.