

The E.U. Environmental Directives

With industrial growth and concentrated populations, Europe is facing serious problems with environmental pollution (such as the Chernobyl accident, Rhine River pollution, acid rain problem, and the mounting industrial waste from automotive and electronic industries). In response, the E.U. has issued two environmental directives in February 2003: the Directive on Waste Electrical and Electronic Equipment (WEEE) and the Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS). All the member countries must achieve the results specified in these

directives, but each member country is responsible for choosing by what meth-

ods and procedures. The purpose of WEEE is to prevent and reduce the waste of electronic and electrical equipment through recycling, reuse and recovery. WEEE applies to almost all electric and electronic devices.

The RoHS directive prohibits the use of six substances that are considered highly hazardous (mercury, cadmium, lead, hexavalent chromium, and brominated flame retardants polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE)). These substances are very toxic, so they have raised concerns regarding soil and water pollution and their effect on living organisms.

WEEE requires that each member country have domestic laws in place by August 13, 2004, and have manufacturers

take responsibility for their waste from August 8, 2005 by implementing such measures as applying symbol markings (see figure) to applicable products. RoHS also requires that each member country have domestic laws in place by August 13, 2004, and prohibits the use of the six hazardous substances in electrical and electronic equipment from July 2006. Sales of products containing any of these six substances will be prohibited in the E.U.

Japanese Companies Respond to E.U. Requirements

Japanese companies that export products to any member country of the E.U. are under pressure to quickly comply.

Final assembly manufacturers are asking their contract suppliers to prepare for the

The key to green procurement is being able to perform inspections accurately and quickly

The European Union has issued two note-worthy environmental directives last year. These directives seek to have the companies that manufacture electronic products be socially responsible for protecting the environment. With a corporate philosophy of realizing the wishes for the "Well-being of Mankind and the Earth", Shimadzu is moving rapidly to have their own products fulfill these directives. Furthermore, Shimadzu is strengthening its ability to help customers meet the E.U. standards through its analytical and measuring instruments.

■ Directive on Waste Electrical and Electronic Equipment (WEEE)

— Effective from February 13, 2003

Purpose

- The prevention of waste electrical and electronic equipment
- The reuse, recycling and other forms of recovery of such wastes so as to reduce the disposal of waste

Scope of Products

1. Large household appliances: Refrigerators, washing machines, microwaves, air conditioners, etc.
2. Small household appliances: Vacuum cleaners, irons, hair dryers, clocks, etc.
3. IT and telecommunications equipment: Personal computers, telephones, cellular telephones, etc.
4. Consumer equipment: Radio sets, television sets, musical instruments, etc.
5. Lighting equipment: Luminaires for fluorescent lamps with the exception of luminaires in households, etc.
6. Electrical and electronic tools: Lathes, welding tools, spraying tools, etc. (not including large stationary industrial tools)
7. Toys: Electric trains, car racing sets, video games, etc.
8. Medical devices: Radiotherapy equipment, cardiology equipment, analyzers, monitors, etc.
9. Monitoring and control instruments: Smoke detectors, thermostats, industrial monitoring and control instruments, etc.
10. Automatic dispensers



Symbol marking to be applied to products subject to WEEE

■ Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS)

— Effective from February 13, 2003

Purpose

- Coordinate the laws of the member states on the restrictions of the use of hazardous substances in electrical and electronic equipment.
- Contribute to the protection of human health and the environmentally sound recovery and disposal of waste electrical and electronic equipment.

Note: This directive will ensure that from 1 July 2006, new electrical equipment does not contain heavy metals mercury, cadmium, lead, and hexavalent chromium, or brominated flame retardants polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

Scope of Products

WEEE product categories 1, 2, 3, 4, 5, 6, 7 and 10, plus electric light bulbs and luminaires in households

■ Directive on End-of-Life Vehicles (ELV)

— Enforced on July 1, 2003

Purpose

The reuse, recycling and other forms of recovery of end-of-life vehicles and their components so as to reduce the disposal of waste

Prohibited Substances

The use of lead, mercury, cadmium, and hexavalent chromium is prohibited from 1 July 2003.

RoHS directive and are working to establish green procurement systems that comply with the RoHS directive. Furthermore, they have the urgent task of setting up inspection systems in order to eliminate the hazardous substances from the parts or materials they purchase.

The effects of these directives are not limited only to European regions. China and Korea are moving toward establishing regulations that consider these directives. In the United States, California has already passed a recycling law modeled after the WEEE and RoHS directives. In addition, the number of member states included in the E.U. itself, which was responsible for establishing these direc-

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tives, increased from 15 to 25 in May 2004. The E.U. is predicted to grow even more over the next ten years. Therefore, the E.U. will have an even greater influence on the environmental policy of individual countries throughout the world.

Shimadzu Provides Support to Meet Environmental Regulations

Based on technology cultivated over many years, Shimadzu has developed many environment-related products which are not only highly accurate and

sensitive, but are also designed with ease-of-use in mind. For example, Shimadzu technology simplifies or eliminates pretreatment procedures and allows one machine to inspect simultaneously for multiple hazardous substances. Shimadzu can help customers establish a fast efficient inspection system focused on material inspection productivity. Shimadzu's strength is being able to provide customers a complete system of products to handle all the substances governed by the RoHS directive — total

solutions tailored to the customer's specific product line. Shimadzu frequently conducts RoHS/ELV-related seminars throughout Japan which provide the latest information regarding the situation in Europe. Building accurate and efficient inspection systems is an extremely important issue. It is the foundation that must support global environmental policy. In order to realize the "Well-being of Mankind and the Earth", the expectations placed on Shimadzu analytical instruments are great.

Compatible with all substances regulated in RoHS and ELV directives Shimadzu's Product Line of Analytical Instruments

EDX-700HS X-Ray Fluorescence Spectrometer



ICPM-8500 Inductively Coupled Plasma Mass Spectrometer

UVmini-1240 Ultraviolet-Visible Spectrophotometer



ICPS-7510 Sequential Plasma Emission Spectrometer



AA-6300 Atomic Absorption Spectrophotometer



IRPrestige-21 Fourier Transform Infrared Spectrophotometer

Regulated Elements/Substances and the Corresponding Analytical Instruments

Hazardous metal/substance	Directive	Prescribed ELV and RoHS limits (See note 3.)	Recommended instrument for inspection	
			High-precision analysis	Screening
Cd,Pb,Hg	ELV and RoHS Directives	Cd:100 ppm Pb,Hg:1,000 ppm	Sequential Plasma Emission Spectrometer ICPS-7510/ICPS-8100 (0.1 ppm min.) Inductively Coupled Plasma Mass Spectrometer ICPM-8500 (0.0001 ppm min.) Atomic Absorption Spectrophotometer AA-6800/AA6300 (0.1 ppm min.)	Energy Dispersive X-ray Fluorescence Spectrometer EDX-700HS/ μEDX-1200 (5 ppm min.)
Hexavalent chromium	ELV and RoHS Directives	1,000 ppm	For analysis of total Chromium: Sequential Plasma Emission Spectrometer Inductively Coupled Plasma Mass spectrometer Atomic Absorption Spectrophotometer UV-VIS Spectrophotometer	For selective analysis of hexavalent chromium:(See note 2.) UVmini-1240 UV-VIS Spectrophotometer +Water-quality Measurement Program Pack (0.02 ppm min.) For analysis of total chromium: Energy Dispersive X-ray Fluorescence Spectrometer EDX-700HS/ μEDX-1200 (100 ppm min.)
Brominated flame retardants	RoHS Directive	1,000 ppm	Gas Chromatograph Mass Spectrometer GCMS-QP2010	For selective analysis: Fourier Transform Infrared Spectrophotometer IRPrestige-21/FTIR-8400S (5% min.) For analysis of total bromine: Energy Dispersive X-ray Fluorescence Spectrometer EDX-700HS/ μEDX-1200 (5 ppm min.)

Notes
 1. The "ppm min." values are the minimum detection limits. The detection limits given for ICP and AA instruments represent the values obtained when 1g of the sample is dissolved in 100 mL of solvent.
 2. Because boiling water, for example, is used for extraction in the pretreatment stage, hexavalent chromium is extracted from the surface layer only. Not all the hexavalent chromium is extracted.
 3. The RoSH limits given in the table are tentative values that were still subject to discussion at the end of November 2003. They had not been officially recognized at this time.