

# Panasonic Industrial Company



Hazardous Substances & RoHS Directive

P.M.D. LCRF Sept.2004

Standard Components Group

## Some acronyms -

RoHS (Restriction of Hazardous Substances)

WEEE (Waste Electrical & Electronic Equipment directive)

AIAG (Automotive Industry Action Group)

ELV (End of Life Vehicle)

IMDS (International Material Data System) Automotive material content

PBB's (Poly-Brominated Biphenyls)

PBDE's (Poly-Brominated Diphenyl Ethers)

The statutory regulations and their enforcement for hazardous substances used in products have become stricter in recent years. In particular, the directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS), which has come into force in the 25 European member states, will prohibit the use of these substances in products in 2006.

Similar statutory regulations are being studied in China and other countries and the trend towards the introduction of similar legislation is expected to gain momentum internationally.

Our company which manufactures and sells products on a global scale, is expected to assume the social responsibility of globally eliminating the use of hazardous substances in its products in order to help preserve the global environment.

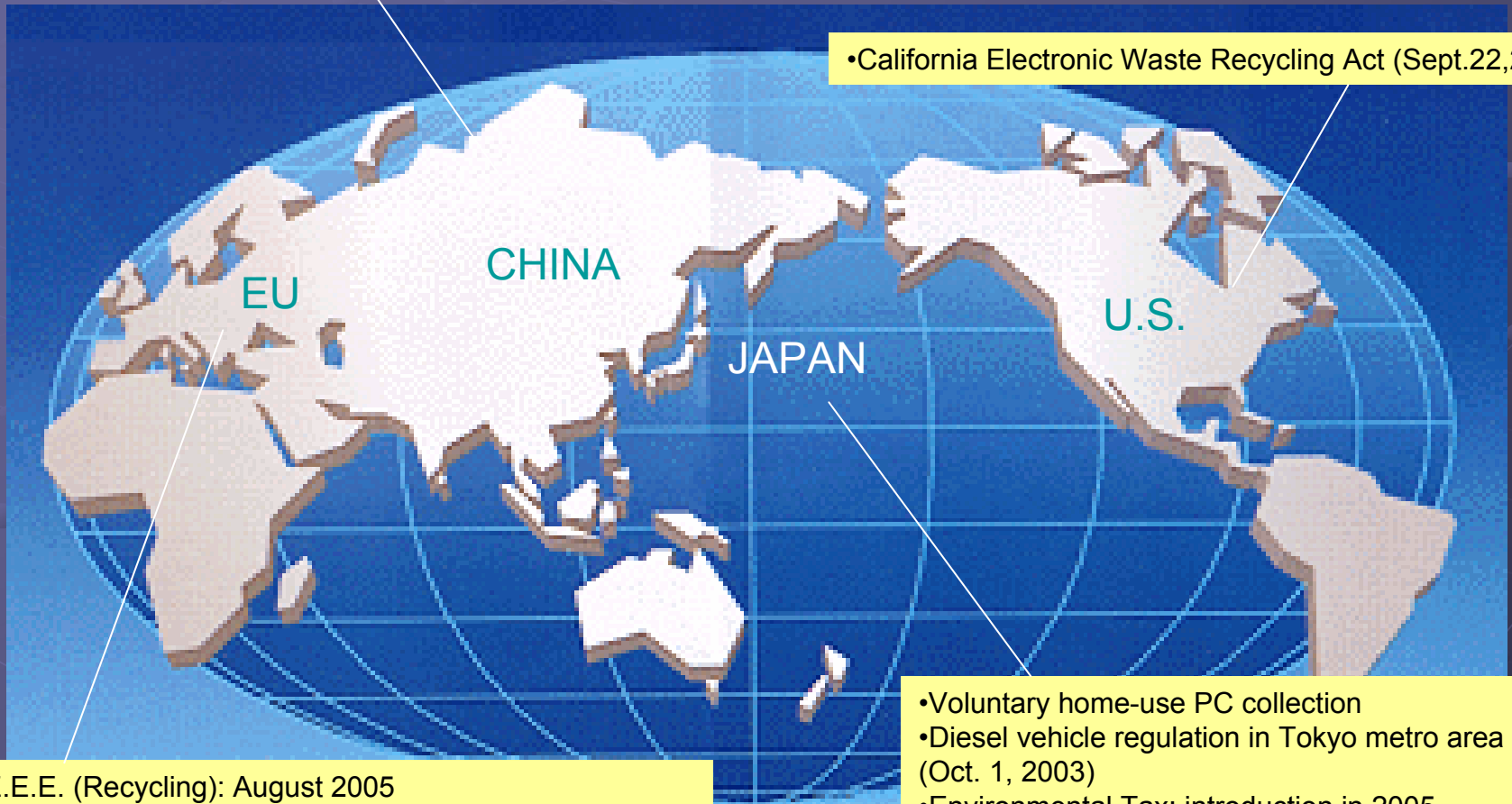
Under these circumstances, the Matsushita Electric Group has announced as part of its Green Plan 2010 a move to ban worldwide the specified hazardous substances.

Technology Application Working Group  
Matsushita Electric Industrial Co., Ltd.

# HAZARDOUS SUBSTANCES STATUTORY REGULATIONS

•Electronic Information Product Pollution Prevention & Management Act ( July 2006?)

•California Electronic Waste Recycling Act (Sept.22,2003)



•W.E.E.E. (Recycling): August 2005  
•RoHS ( Hazardous Substances) July 2006  
•ELV : (Vehicle recycling and Harzardous sub. Regulations)  
•EuP Products: Environmental friendly product designs  
•REACH: New chemicals policies ( 2006?)

•Voluntary home-use PC collection  
•Diesel vehicle regulation in Tokyo metro area (Oct. 1, 2003)  
•Environmental Tax: introduction in 2005

# INITIATIVES BY MATSUSHITA ELECTRIC

## **Matsushita Electric Environmental Vision** Green Plan 2010

(Formulated in Oct. 2001)

Our vision formulated to contribute to the realization of a sustainable society in the 21<sup>st</sup> Century. It consists of 7 items based on environmental and ecological thinking.



# EXAMPLES OF PROBLEMS ENCOUNTERED WITH USING CHEMICAL SUBSTANCES ...

<p>Use of <b>Cadmium</b> in the Netherlands Approximately 1.3 MM units were recalled.</p>	<p>Content exceeding allowable limits was detected in the connection cable used in PC game machines.</p>
<p>Use of <b>Lead</b> in the U.S. by 105 electrical Companies approx. ~ \$300 MM total settlements.</p>	<p>Content exceeding the value permitted by California Proposition 65 was detected in Power cords.</p>
<p>Products recalled by 42 companies because “neoprene FB” (<b>naphthalene chloride</b>) found</p>	<p>Naphthalene Chloride, classified as Class 1 specified Chemical substance by Law Concerning the Examination and Regulation of Chemical Substances was imported without import permission.</p>
<p>Use of <b>unapproved food additives</b> voluntary product recall by 26 resellers</p>	<p>Compensation paid as damages may exceed the annual sales, <b>1.6 B Yen</b> of the companies Concerned.</p>

# STATUTORY REGULATION: WEEE

## WEEE: Waste Electrical and Electronic Equipment

The member states approved by the European Parliament must establish a collection system that separates waste of electrical and electronic equipment from general waste in order to reduce consumption and environment pollution caused by the waste of electrical/electronic equipment.

The equipment manufacturers are required to appropriately treat their own end-of-life products and consider ways of disposing the waste in a phase of new products, including measures introduced into the design and manufacturing process.

### Legal Obligations

### Commencement

---

Separate collection and recycling of  
End-of-life products

August 31, 2005

---

Achievement of the target collection  
(4Kg./person/year) in each member  
State

End of 2005

---

Achievement of recycling and recovery  
rates (annual average)

End of 2006

---

# STATUTORY REGULATION: RoHS

## RoHS: Restriction of the use of certain Hazardous Substances

The restriction intends to promote statutory regulations of hazardous substances in electrical and electronic equipment in each country and to minimize the risk to the environment and Human health in all stages from production to disposal.

Even separate collection and recycling increases the risk to human health and the Environment by pollution from mercury, cadmium. Lead, hexavalent chromium and PBB and PBDE.

### Major Obligations and Commencement Time

Requirement	Prohibit the use of 6 specified hazardous substances in products.		
Target Substances (*)	<ol style="list-style-type: none"><li>1) Lead</li><li>2) Mercury</li><li>3) Cadmium</li><li>4) Hexavalent chromium</li><li>5) PBB</li><li>6) PBDE</li></ol>	<p>content &lt;0.1% by weight content &lt;0.1% by weight content &lt;0.01% by weight content &lt;0.1% by weight content &lt;0.1% by weight content &lt;0.1% by weight</p>	
(*) draft, not-final			
Target Equipment	Almost all kinds of electric/electronic equip.		
Applicable Time	July 1, 2006		

# WHY HAZARDOUS SUBSTANCES ARE PROHIBITED ...

Name		Application	Adverse Effects
<b>Lead (Pb)</b>		Solder, contact/fuses, Component plating, cord insulation stabilizer...	Limb paralysis, anemia, Anorexia, headaches, Colic seizures, etc...
<b>Mercury (Hg)</b>		Fluorescent lamp, LCD backlighting, paint pigments, etc..	Skin and eye irritation, Lung edema, kidney disorders, Ataxia, etc...
<b>Cadmium (Cd)</b>		Electrical contacts in switches And relays, temperature fuses, Paint pigments, etc..	Eye irritation, weakness, dry retching, Kidney disorder, anorexia, etc...
<b>Hexavalent Chromium(Cr<sup>6+</sup>)</b>		Screws, sheet metal plating, etc..	Skin-mucosa ulcer, bronchial Infection, kidney disorder, lung cancer, etc...
<b>Specified Bromine- based Flame- Retardants</b>	<b>Polybromobiphenyl (PBB)</b>  <b>Polybromodiphenyl Ether (PBDE)</b>	<b>Packaging, Filters</b>	<b>Thyroxin disturbance, anomaly, etc.</b>  <b>Thyroxin disturbance, dioxin-like Toxicity, etc.</b>

## ITEMS THAT ARE NOT SPECIFIED IN THE RoHS DIRECTIVE (examples)

- Exemptions: **lead** used in optical **glass**, etc. ...
- Maximum acceptance values ( thresholds)  
Definitions of the denominator of the acceptable value  
(**component** or substance) ...
- Definitions on **market phase-in**  
At the time of shipping from the factory, delivery to  
an EU country and selling to retailers ...
- Clarification of **borderline products**  
Solar battery panels, etc. ...

Panasonic Industrial Company : Lead-free ( RoHS Compliance) Electronic Components



Category	Product Type	Product Series	Plating Materials for Electrodes, etc.	RoHS Compliant (Pb, Hg, Cd, Cr+6, PBB, PBDE)	Special Soldering Conditions	Part Number Change	
Electrolytic Capacitors	Aluminum Electrolytic Capacitors (Radial lead type)	ECA, EEA/EEU, ECE-A	Sn	✓	-	No	
	Aluminum Electrolytic Capacitors (Snap-in type)	ECE-S, ECO-S, ECE-C <del>ECG</del> EET	Sn	Please Inquire	-	No	
	Aluminum Electrolytic Capacitors (Screw Terminal type)	EES	Al terminals	Please Inquire	-	No	
	Aluminum Electrolytic Capacitors (Surface mount type)	EEE (≤10mm dia.) (* EEV contains Pb)	Sn/Sn-Bi	✓	+5sec. at 250 deg C (Dia. 4 to 6.3); +5sec. at 235 deg C (Dia.8 to 10)	No	
	Electric Double Layer Capacitors	EEC	Sn	✓	-	No	
Ceramic Products	Specialty Polymer Aluminum Electrolytic Capacitors	EEF	Sn	✓	Reflow peak temp. < 10sec at 240 degC	No	
	Multilayer Ceramic Chip Capacitors	ECJ, ECV, ECD	Sn	✓	-	No	
	Multilayer Chip NTC Thermistors	ERT-T	Sn	✓	-	No	
	Multilayer Chip Varistors	EZT	Sn	✓	-	No	
	Ceramic Resonators	EFJ-(C/N), EFO-	Sn, Au	✓	-	No	
	"ZNR" Transient / Surge Absorbers (Discrete)	ERZ	Sn	✓	-	No	
	SAW Filters	EFC-H	Au	✓	-	No	
	Ceramic Disc Capacitors (Discrete)	ECK/ECC	Sn	✓	-	No	
	SAW Duplexers	EF5	Au	✓	-	No	
	Disc Type NTC Thermistors (Discrete)	ERT-D	Sn	✓	-	No	
	Glass-sealed NTC Thermistors (Axial)	ERT-G	Sn-Ag-Cu	✓	-	No	
	SMD High-voltage Ceramic Capacitors	ECK/ECC, T3F	Sn-Ag	✓	-	No	
	Adjustable (pre-set) Ceramic Capacitors (Series J and L)	ECR-LA***12, ECV-IZW**B3T	Sn-Cu	✓	-	No	
	Resistors	Fixed Resistors (Thick Film Chip)	ERJ	Sn	✓	240 deg C max.	No
		Fixed Resistors (Carbon: Discrete)	ERD	Sn	✓	240 deg C max.	No
Fixed Resistors (Metal Oxide Film: Discrete)		ER6/ERX-(S, F)	Sn	✓	240 deg C max.	No	
Fixed Resistors (Array: SMD)		EXB-(1, 2, 3, V, S)	Sn	✓	240 deg C max.	No	
Fixed Resistors (Metal Film Chip: SMD)		ERA	Sn	✓	240 deg C max.	No	
Ferrite EMI Filters	Trimmer Potentiometer (Open Chip)	EVM-(2, 3, 1D)	Sn	✓	Please Inquire	No	
	Chip Bead Cores	EXC-(CL, ML, 3B)	Sn	✓	240 deg C max.	No	
	2 Mode Noise Filters	EXC-(24CB, CF)	Sn	✓	240 deg C max.	No	
	Common Mode Noise Filters	EXC-24CD	Sn	✓	240 deg C max.	No	
	Chip Bead Array	EXC-28B	Sn	✓	240 deg C max.	No	
Transformers	Chip EMI Filters	EXC-CET	Sn	✓	240 deg C max.	No	
	Inductors	Chip Inductors (Wire Wound Type)	ELT-(A, B, C, ND)	Sn-Cu	✓	250 °C / 10 sec. / 2 times	No
		Chip Inductors (Laser cut / Non-Winding Type)	ELT-(E, F)	Sn	✓	240 °C / 10 sec. / 2 times	Yes
		Coil Type EMI Filters (D Type: SMD)	ELK-D	Sn	✓	240 °C / 10 sec. / 2 times	No
		Voltage Step-up Coils (Model Type: SMD)	ELT	Sn-Cu	✓	240 °C / 10 sec. / 2 times	No
		Choke Coils ( SMD )	ELL	Sn	✓	240 °C / 10 sec. / 2 times	No
	Choke Coils ( Leaded )	ELC	Sn-Cu	✓	240 °C / 10 sec. / 2 times	No	
	Inverter Transformers (Model Type: SMD)	ETJ-(09M, 11M, 13M, 15M, 16M)	Sn	✓	240 °C / 10 sec. / 2 times	No	
	Inverter Transformers (Model Type: SMD)	ETJ-(FJ1B, FJ2D, FJ23)	Sn-Cu	✓	250 °C / 10 sec. / 2 times	No	
	Power Choke Coils (SMD)	ETQ-P	Sn, Sn-Cu	✓	240 °C / 10 sec. / 2 times	No	
	Line Filters (Discrete)	ELF	Sn-Cu	✓	240 °C / 10 sec. / 1 time	No	
	Power Transformers (Discrete)	ETP	Sn-Cu	Please Inquire	Custom - Please Inquire	No	
	Switching Transformers (Discrete)	ETS	Sn-Cu	✓	Custom - Please Inquire	No	
	Film Caps	Surface Mount Type	ECH-U, ECW-U, ECP-U	Sn-Ag-Cu	✓	ECHU: 240 deg C max. ECWU/ECPU: 240 deg C max.	No
		Leaded Type	ECQ-(E, S, M, P, F, K, V, U)	Sn	✓	-	No
Leaded Type		ECH-S, ECW	Sn	✓	-	No	
High Frequency Products & Hybrid ICs	Electronic Tuner (ER03R)	Please Inquire	Sn-Cu, Plated 3-layer metal	Please Inquire	-	Please Inquire	
	VCO (Model)	Please Inquire	Au	Please Inquire	-	Please Inquire	
	RF Devices	EHF	Sn	Please Inquire	-	Please Inquire	
	Hybrid IC	EHD	Sn, Sn/Sn-Bi	Please Inquire	-	Please Inquire	
Electromechanical Components	Electronic Control Unit	Please Inquire	Sn-Ag-Cu	Please Inquire	-	No	
	Remote Control Units	Please Inquire	Sn-Ag-Cu	Please Inquire	-	Please Inquire	
	Function Switches	ESE, ESD, ESB	Sn-Cu, Ag, Sn-Zn-Ni	✓	-	No	
	Light Touch Switches	EVO	Plated 3-layer metal, Au	✓	-	No	
	Volumes	EVU, EVJ, EWA	Sn-Cu, Plated 3-layer metal	✓	-	No	
	Encoders	EVQ, EVE	Sn-Cu, Plated 3-layer metal	✓	-	No	

\* Material contained herein is strictly for reference. Please verify your design. Review specifications before using any of these devices.  
 - For Remote Controls and Speakers, only soldering materials are described (axial terminal plating materials are not included).  
 - For Electronic Tuners the frame material is 3-layer metal plated (Sn-Zn-Ni), and terminal plating material is Sn-Cu.  
 - For VCOs, high-frequency devices and hybrid ICs the internal soldering material is Sn-Ag-Cu.  
 - For Custom Components of Hybrid ICs, etc. plating materials are individually chosen from Sn, Sn-Cu, Sn/Sn-Bi, Au and others.

K coating for Printed Circuit Boards is a metal-reactive, heat resistant finishing (new development).  
 Some Components may be Lead-Free but may not be able to withstand high reflow temperatures. Please check actual specification.  
 Maximum time above soak temperature is equally important as peak reflow temperature. Please check actual specification.  
 Availability of Lead-Free parts is based on product production standpoint, not what may be available at your local distributor.  
 Sn (Tin), Cu (Copper), Ag (Silver), Al (Aluminum), Au (Gold), Bi (Bismuth), Zn (Zinc), Ni (Nickel), Pb (Lead)  
 Information contained above is subject to change without notice.

For latest information please see our Web site, under Product Alerts:  
 Lead free (RoHS compliant) Electronic Components



Prepared by:

Panasonic Industrial Company  
PMD/Standard Components Div.  
2 Panasonic Way  
Secaucus, New Jersey, 07094

2004

Source from:

Matsushita "The Hazardous Non-use Substances Techo School Textbook"  
No Hazardous Substances in Products Project  
Green Technology Development Group  
Production Core Engineering Laboratory  
Technology Application Working Group  
Matsushita Electric Industrial Co., Ltd.