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GREEN PRODUCT MANAGEMENT SYSTEM SERVICES –

A solution to meet Waste
Electrical and Electronic
Equipment (WEEE) / Restriction
of the Use of certain
Hazardous Substances
(RoHS) Requirements



Green Product Management System Services –

A solution to meet Waste Electrical and Electronic Equipment (WEEE)/ Restriction of the Use of certain Hazardous Substances (RoHS) Requirements

The voices and concerns to protect, preserve, and improve the environment have grown rapidly in recent years. Many harmful substances were banned, restricted or are facing phase-out programs. To suffice the needs of future generations, natural resources must also be utilized prudently, rationally and healthily. In order to ensure these sustainable ends, SGS is unstinting in its efforts to help both buyers and manufacturers to satisfy the overriding aims: Improve environmental quality and protect human health through effective management in product development, production, consumption and behaviour and advocates, *inter alia*, the reduction of wasteful consumption of natural resources and the prevention of pollution.



Important EU Directives on Electrical and Electronic Equipment (EEE)

13th February 2003, the EU Council and the European Parliament published two important directives, which purposed to control the disposal of waste electrical and electronic equipment (EEE) and restrict the use of certain hazardous substances (RoHS) in these products. All EEE imported to the EU must therefore comply to the requirements of these two particular directives:

Table 1 The approved RoHS maximum concentration value in homogeneous materials*

Substances	Maximum concentration in each homogeneous material *
Lead (Pb)	0.1% (1000 ppm)
Mercury (Hg)	
Hexavalent chromium (Cr(VI))	
Polybrominated biphenyls (PBBs)	
Polybrominated diphenyl ethers (PBDEs)	
Cadmium (Cd)	0.01% (100 ppm)

* Homogenous materials means a unit that cannot be mechanically disjointed in single materials

1. **Directive 2002/96/EC** of the European Parliament and of the Council of 27 January 2003 on **Waste Electrical and Electronic Equipment (WEEE)**. Its purpose is for the prevention of Waste Electrical and Electronic Equipment (WEEE). It seeks to reuse, recycle and recover such wastes so as to reduce their disposal as municipal solid waste (MSW). It also seeks to improve the environmental performance of all operators.
2. **Directive 2002/95/EC** of the European Parliament and the Council of 27 January 2003 on the **Restriction of the use of Certain Hazardous Substances (RoHS)** in the Electrical and Electronic Equipment. Its purpose is to restrict the use of hazardous substances in electrical and electronic equipment, so as to protect human health and the environment from the disposal of waste electrical and electronic equipment.

The RoHS Directive requires, by 1 July 2006, substitution of the following hazardous substances:

1. Cadmium
2. Lead
3. Mercury
4. Hexavalent chromium
5. Polybrominated biphenyls (PBBs)
6. Polybrominated diphenyl ethers (PBDEs)

The approved RoHS maximum concentration value in homogeneous materials is as shown in Table 1.

Lead exemptions:

- Lead-based alloys containing more than 85% lead e.g. Sn/Pb solders etc. Time limit (until 2010) deleted for lead solders in servers, storage & storage array systems. (All exemptions will be re-assessed in 2010, as part of their review every 4 years after implementation.)
- Compliant-pin VHDM (very High Density Medium) connector systems
- Use as a coating material for a thermal conduction module c-ring
- Optical and filter glass
- Solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80% and less than 85% by weight
- Solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages.

Cadmium exemptions:

- Cadmium and its compounds in electrical contacts
 - Optical and filter glass
3. Table 2 exhibited the electrical and electronic equipment covered by the Directives. EEE are those equipment driven by voltage rating not exceeding 1000V for A.C. current and 1500V for D.C. current.

Table 2 Categories of electrical and electronic equipment covered by WEEE and RoHS

WEEE (2002/96/EC)	RoHS (2002/95/EC)
(1) Large household appliances	(1) Large household appliances
(2) Small household appliances	(2) Small household appliances
(3) IT and telecommunications equipment	(3) IT and telecommunications equipment
(4) Consumer equipment	(4) Consumer equipment
(5) Lighting equipment (with the exception of filament light bulbs & household luminaries)	(5) Lighting equipment
(6) Electrical and electronic tools (with the exception of large-scale stationary industrial tools)	(6) Electrical and electronic tools (with the exception of large-scale stationary industrial tools)
(7) Toys, leisure and sports equipment	(7) Toys, leisure and sports equipment
(8) Medical device (with the exception of all implanted and infected products)	(8) Automatic dispensers
(9) Monitoring and control instruments	
(10) Automatic dispensers	

4. In accordance with the WEEE directive, the targets of recovery, reuse and recycling rate have to be met by 31 December 2006 are as shown in Table 3.

5. According to BS EN 50419:2005, the following markings shall be applied to the electrical and electronic equipment put on the market after 13 August 2005.
- a) a unique identification of the producer.
 - 1) This can take the form of a brand name, trademark, company registration number or other suitable means to identify the producer.

Table 3 Targets of recovery, reuse and recycling rate as required in WEEE (2002/96/EC)

WEEE (2002/96/EC)	Recovery rate per appliance (w/w)	Reuse and Recycling rate of component, material and substance per appliance (w/w)
(1) Large household appliances	80%	75%
(2) Small household appliances	70%	50%
(3) IT and telecommunications equipment	75%	65%
(4) Consumer equipment	75%	65%
(5) Lighting equipment (with the exception of filament light bulbs & household luminaries)	70%	50% 80% (for gas discharge lamps)
(6) Electrical and electronic tools (with the exception of large-scale stationary industrial tools)	70%	50%
(7) Toys, leisure and sports equipment	70%	50%
(8) Medical device (with the exception of all implanted and infected products)	/	/
(9) Monitoring and control instruments	70%	50%
(10) Automatic dispensers	80%	75%

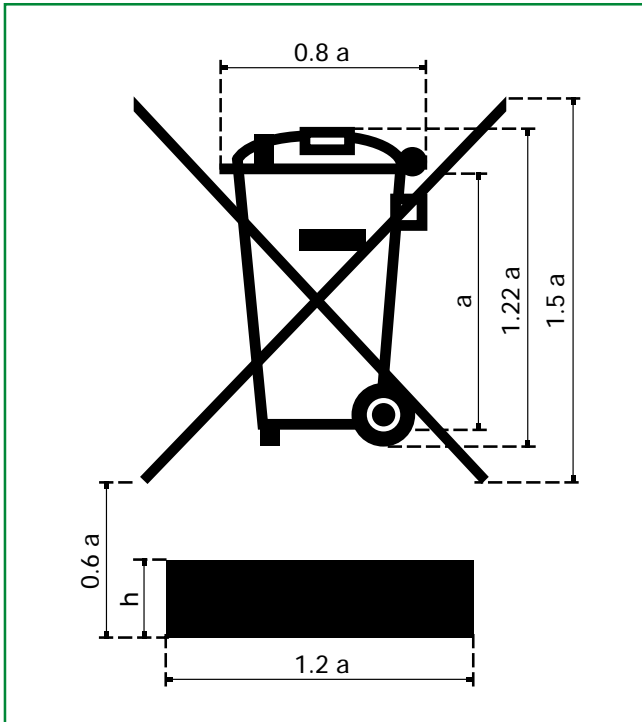


Figure 1 Marking of electrical and electronic equipment

Note: The symbol of the crossed out wheeled bin and the dimensional relationship are the same as required for batteries and defined in Figure of EN61429/A11

- 2) Whichever option is chosen this shall be recorded in the member state's register of producers in accordance with Article 12(1) of Directive 2002/96/EC (WEEE);
- b) put on the market after 13 August 2005 shall be identified by either
- 1) the date of manufacture/put on the market, in un-coded text in accordance with EN28601 or other coded text, for which the code shall be made available for treatment facilities, or
 - 2) marking as shown in Figure 1 being an additional mark used in conjunction with the crossed-out wheeled bin in accordance with Annex IV of Directive 2002/96/EC already required under Article 10(3) of this Directive;

The marking shall be accessible, durable, legible and indelible.

- In the absence of relevant product standards or if the relevant product standard does not include marking durability requirements, compliance is checked by inspection and by rubbing by hand for 15s with a piece of cloth soaked with water and again for 15s with a piece of cloth soaked with petroleum spirit. After this test, the marking shall be legible, it

shall not be easily possible to remove the marking. If used, marking plates or labels shall show no curling.

If size or other characteristics such as functionality of the product means that the marking cannot be applied on the product, the marking shall be

- on a flag on the fixed supply cord (if any), and
- in the operating instructions and
- warranty certificates included with the product, if supplied.

If none of the above applies then the marking shall be on the packaging.

What SGS can help?

1. Green Product Management System Services
2. Product Testing – Restricted Substance Testing Services
3. Technical Consultancy
 - 3.1 Lead-free technical consultancy
 - 3.2 Lab construction consultancy
 - 3.3 Development of recycling plan
 - 3.4 ... and more
4. Restricted Substance Database
5. Certified Parts and Companies Database
6. Product & Management System Certification
7. Staff Training – Advanced training program on WEEE/ RoHS and Green Product Management System

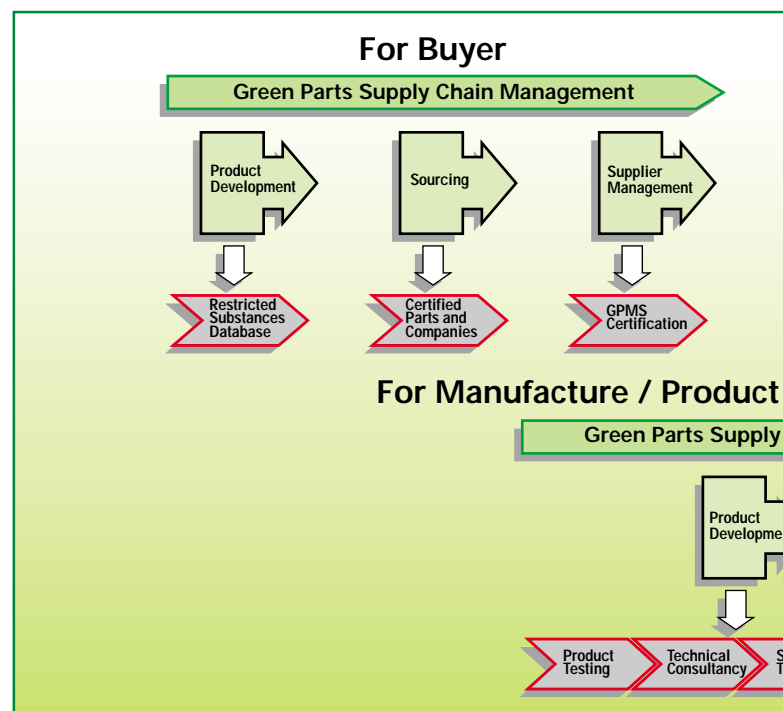


Figure 2 SGS services to Green Parts Supply Chain

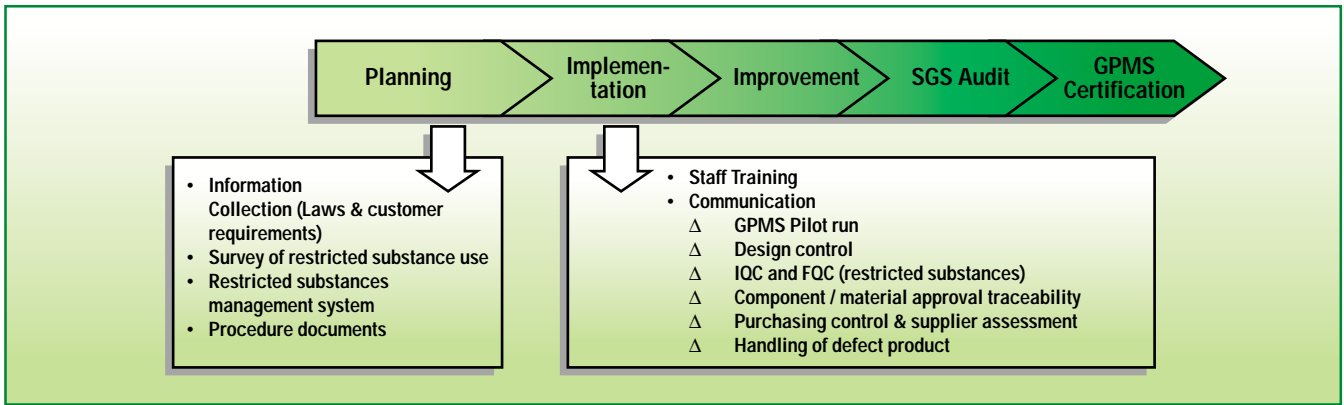


Figure 3 Green Product Management System implementation flowchart

Green Product Management System Services

The Green Product Management System (GPMS) is currently advocated by SGS as a comprehensive solution for the producers to comply with environmental regulations (e.g. WEEE / RoHS) and to manufacture of environmentally friendly products. GPMS service includes the following services:

- Green Supply Chain Management
- Management System Upgrading
- Green Product Design
- Training
- Technical Standard
- GPMS Audit & Certification

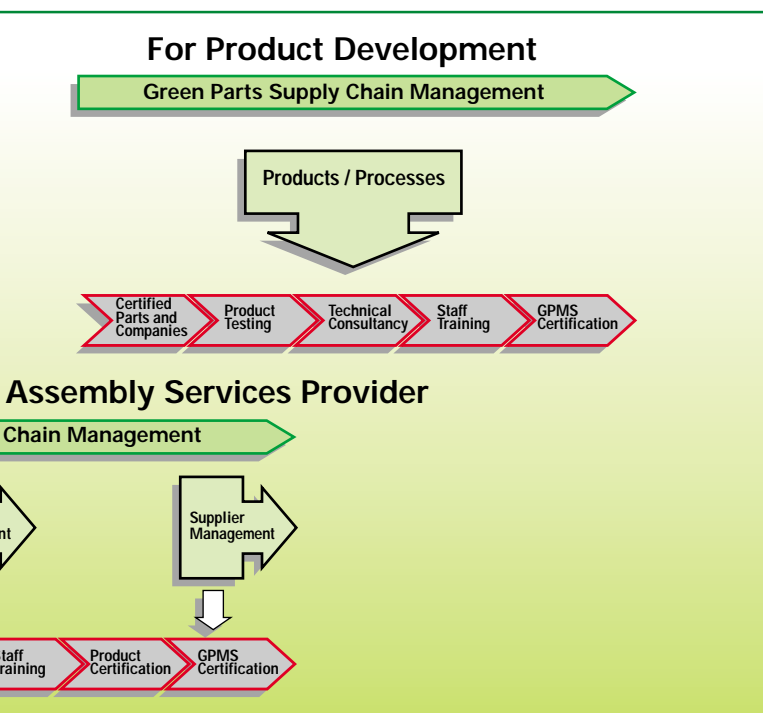
The implementation flowchart is as shown in Figure 3.



As a result of synergy between SGS experts of chemical testing, law and system certification, GPMS is a systematic solution tailored for electronic industry to meet requirements from worldwide environmental legislation as well as various “green” requirements from international buyers.

Potential benefits of GPMS implementation include:

- High cost and time effectiveness in meeting various environmental requirements of global markets.
- Promote green competency to satisfy customer expectations
- Green producing capability evidenced with GPMS certificate, strengthening client confidence
- System with self-promotion capability, updatable to meet future legislative requirements



Product Testing – Restricted Substance Testing Services

- Initial stage on demonstrating compliance with RoHS
- Registered criteria for certified parts database
- Part of the product certification program

Testing Item	Testing Reference	Sample Size per Colour per Material
RoHS requirement list		
Cadmium Content	EN 1122	5 grams
Chromium (VI) Content	EPA 3060	5 grams
Lead Content	EPA 3050B / 3051	5 grams
Mercury Content	EPA 3052 / 3051	5 grams
Cadmium + Lead + Mercury + Chromium (VI)	94/62/EC or CONEG	10 grams
Polybrominated Biphenyls (PBBs)	In-house method by GC/MS	10 grams
Polybrominated Diphenyl Ether (PBDEs)	In-house method by GC/MS	10 grams
Other concerned list		
Polychlorinated Biphenyls (PCBs)	In-house method by GC/ECD/MS	10 grams
Mirex	In-house method by GC/MS	10 grams
Chlorinated Paraffins (CPs)	In-house method by GC/MS	10 grams
Polychlorinated Naphthalene (PCNs)	In-house method by GC/MS	10 grams
Organotin (TBT and TPhT)	In-house method by GC/MS	15 grams
Azo Compounds	In-house method by GC/MS	10 grams
Nitrosamines	In-house method by GC/NPD/MS	30 grams
Bisphenol A	In-house method by LC/MS	10 grams
Tetrabromobisphenol-A (TBBP-A)	In-house method by GC/MS	5 grams
Tetrabromobisphenol-A-bis (2,3-dibromopropylether) (TBBP-A-bis)	In-house method by LC/DAD/MS	5 grams
Tris-(aziridiny) Phosphine Oxide (TEPA)	In house method by GC/NPD/MS	5 grams
Bis (2,3-Dibromopropyl) Phosphate (BDBPP)	In-house method by LC/DAD/MS	5 grams
Tris-(2,3-Dibromopropyl) Phosphate (TRIS)	In-house method by LC/DAD/MS	5 grams
Nonylphenol (NP), Octylphenol (OP) and Nonylphenol Ethoxylates (NPEOs)	In-house method by LC/DAD/MS	10 grams
Identification of PVC	In-house method by FT-IR	10 grams
Formaldehyde in wood	EN 120	10 grams

Technical Consultancy

- **Lead-free technical consultancy**
 - Δ Selection of lead-free soldering technology and soldering materials
 - Δ Upgrading of soldering equipment
 - Δ Fine-tuning of soldering parameters
 - Δ Quality improvement program
 - Δ Lead-free reliability testing
- **Lab construction consultancy**
 - Δ Lab construction planning (equipment, staffing, layout, etc.)
 - Δ Testing technology transferring
 - Δ Training
 - Δ Correlation testing
- **Development of recycling plan**
 - Δ Product recycling plan manual

- Δ Calculation of recycling rate and recovery rate
- Δ WEEE compliance scheme information

- and more

Restricted Substance Database

- Technical database to registered clients
- Collection of updated technical requirement

Certified Parts and Companies Database

- Value added services to registered user

Product & Management System Certification

- Demonstrating the continuous compliance with WEEE/ RoHS
- Certification including testing and on-site assessment

Staff Training – Advanced training program on WEEE/RoHS and Green product management system (GPMS)

Course Outline

Module One: Awareness and Competence Building (4 Days)

- WEEE/RoHS awareness and knowledge (1 Day)
- Concerns of hazardous substances, identification and evaluation (1 Day)
- Material and substance survey and development of green supply database (1 Day)
- Development of environmental product management system (1 Day)

Module Two: GPMS Review and Analysis (3 Days)

- Eco-design considerations & Life Cycle considerations (1 Day)
- GPMS document and database review, supply chain surveys (1 Day)
- Conducted on-site to review the organization's documentation development on material and substance survey database
- Skills and techniques on GPMS auditing (1 Day)

Module Three: GPMS Audit (2 Days)

- On-site performance assessment and review – system performance (1 Day)
- On-site performance assessment and review – product data tracking (1 Day)

Module Four: Environmental Product Declaration Development (3 Days)

- ISO Guide 64 on the inclusion of environmental aspects in product standards, ISO 14020 on environmental labels and declarations (1 Day)
- Coaching and Development of Environmental Product Declaration (2 Days)

Module Five: Environmental / Sustainability Reporting (3 Days)

- GRI Guidelines on sustainability reporting, AA 1000 framework and assurance standard (1 Day)
- Coaching on SR material preparations (2 Days)

Company Profile

SGS SA

The SGS Group is the clear global leader and innovator in inspection, verification, testing and certification services. Founded in 1878, SGS is recognized as the international benchmark for the highest standards of expertise and integrity. With 39,000 employees, SGS operates a network of almost 1,000 offices and laboratories around the world.

SGS-CSTC Standards Technical Services Co., Ltd.

SGS-CSTC Standards Technical Services Co., Ltd. (SGS-CSTC) is a joint venture established in 1991 by SGS and China Standards Technology Development Corporation (CSTC). Since then, SGS-CSTC has registered 16 branches, 9 offices successively in Shanghai, Tianjin, Dalian, Qingdao, Guangzhou, Xiamen, Shenzhen, Ningbo, Qinhuangdao, Nanjing, Zhanjiang, Wuhan, Chongqing and set up 30 laboratories. With a team of more than 2,300 multi-disciplined specialists and state-of-the-art laboratory facilities, SGS-CSTC can provide a wide range of services

throughout China including Consumer Product Inspection, Agricultural products & minerals & Petrochemicals Inspection, Product Consultancy, Laboratory Testing (for toys, hardgoods, textiles & footwear, chemicals, food and electrical /electronic products), Systems & Services Certification and Trade Assurance Services.

SGS Hong Kong Ltd.

SGS Hong Kong was founded in 1959 as the pioneer in quality services. With over 40 years local experience, SGS is now equipped with a strong team of 800 committed professionals in multi-disciplines. As the leader in one-stop total quality services, SGS Hong Kong offers high-level expertise in testing, verification, technical consultancy and inspection of products from various industries. Our professionals also contribute to the enhancement of clients' management standards through training and certification. With its high standard of services, SGS serves commercial clients, governments and international institutions.

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