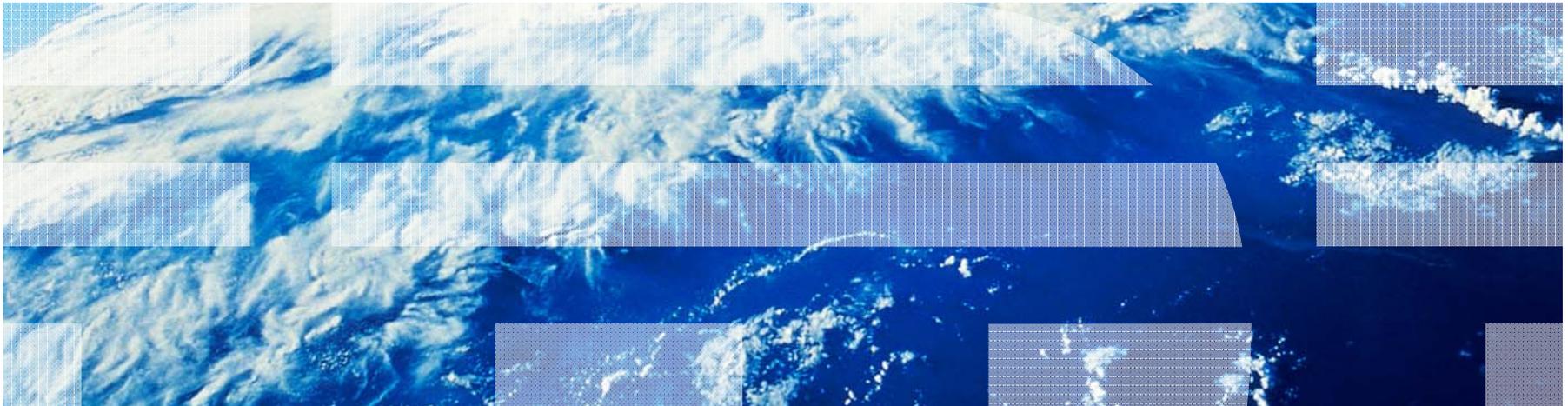


Reduction of Hazardous Substances (RoHS) China's Approach to Environmental Information

Thom Jagielski – STG Env Affairs Focal Point



IBM's Regulated Chemical Management Process for Products

■ IBM Product Stewardship Program

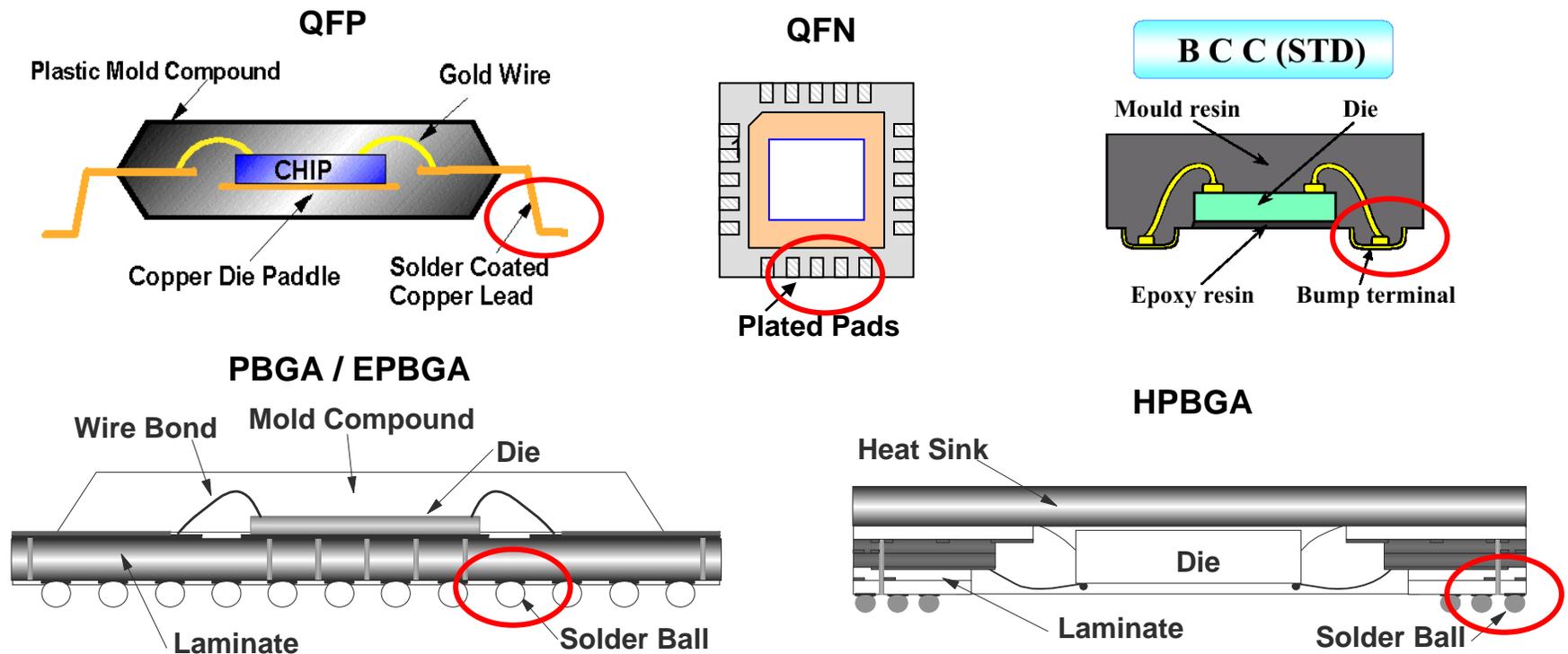
- Established Standards for the Environmental Design of its Products & Packaging
- Allows Compliance w/Numerous Worldwide Regulatory Requirements
 - RoHS, REACH, Halogen-Free
 - EU, China, Turkey, India, Korea, etc
- IBM Products Are Shipped to 160 Countries
 - Global Harmonization of Regulations Is Very Important to Market Access
 - Minimization of Redundant Work
 - Minimization of Cost

■ Keys Elements of Material Management Process

- Material Declaration of the Constituent Information
 - IBM and Industry Standard Reporting Format
- RoHS Analytical Testing Plan
 - Annual Testing of materials at the Homogenous Material Level
 - > 15 Separate Materials in Typical Module
 - > Solder, Die, Cap, Laminate, Wire Bond, Capacitor, etc
 - Qtrly testing of finished Modules by Package family
 - Supplier Testing Agreements in Place with Most of our Raw Material, Laminate, Components & Bond and Assembly Suppliers

Where is the Lead in a Wirebond Component?

- Quad Flat Pack (QFP) lead plating
- Quad Flat Non-Leaded (QFN) and Bump Chip Carrier (BCC) plated pads / contacts
- Plastic Ball Grid Array (PBGA), Enhanced Plastic Ball Grid Array (EPBGA) and High Performance Plastic Ball Grid Array (HPBGA) solder balls



China RoHS Regulation

- ❑ Issued on Feb. 28, 2007, Phase 1 effective on March 1, 2007
- ❑ Scope: Electronic Information Products (EIP) Entering Chinese Market
- ❑ Key Elements Implemented:
 - Products Should Be Environmentally Friendly and Promote Recycling
 - Unique to China Are the Following:
 - Products Are Labeled Indicating Presence of Certain Toxic & Hazardous Materials
 - Label Has Environment-friendly Use Period
 - Label to Provide Recycle Code

NEW REQUIREMENTS – Effective 1Q2011

- RoHS Restrictions: Mimic European Union RoHS Regulations
 - Restrict Content of Lead, Mercury, Cadmium, Hexavalent Chromium, Polybrominated Biphenyls & Polybrominated Biphenyl Ethers
 - Certification Process - Voluntary in Name Only To Be Used for Future Mandatory Product Testing
 - Any Material Change Drives Re-Certification of Product
 - Certification Testing Conducted by pre-selected Chinese Labs
 - Process Materials, Manufacturers, Suppliers Identified & Alternates
 - Complete Bill of Materials, Raw Material Trade Names
 - Mandatory Factory Compliance Audits

Key Implementation Barriers for Compliance Certification Testing

■ **Intellectual Property Protection**

- Voluntary Compliance Certification tests and audits represent risks to semiconductor intellectual Property (IP) and know how.
- Semiconductor Companies Invest up to 25% of Corporate Revenues to Invent New Proprietary Processes & Materials

■ **Factory Audits**

- US Companies are Bound by Strict U.S. Export Laws & Regulations on Controlled Technology.
- For Some Components Manufactured in the U.S., Laws Would Prevent Audit of Production Areas
- Testing & Audits Expose Proprietary Material Compositions
 - Violate the U.S. Laws & Regulations on Certain Semiconductor Technologies
 - Result in Fines, Penalties & Loss of U.S. Licenses for Export or Import Products.

Product Comparisons

产品比较

	Multi I/O Receptacle Reverse Offset Connector (entire product line) 多通道输入输出插座端反向沉版式 连接器（整个生产线）	HP Laserjet Printer 惠普激光打印机	GE MRI Scanner GE 磁共振扫描仪
Number of Components 零件数量	4-5	~2000	~30,000
Certification Testing 认证检测	118 days [118天]	44 days [44天]	660 days [660天]
Certification Expense 认证费用	\$1186 (USD)	\$9400 (USD)	\$141,000 (USD)
# of products supplied to laboratory 向实验室提供的产品数量	Only components 仅有组件	Two Printers 两台打印机	Two MRI Scanners (Chinese)

TechAmerica

Company Comparisons

公司比较

	Company A (Component Manufacturer) A公司 (组件制造商)	Company B (Marketable ICT Manufacturer) B公司 (可销售ICT制造商)	Company C (High-End Enterprise Level Products) C公司 (高端企业级产品)
Number of Products in Chinese Market (estimated) 产品在中国市场的数量 (估计)	500,000	2,000	200
Average Certification Expense (estimated) 平均认证费用 (估计)	\$1100 (USD) 60 Days [60天]	\$9400 (USD) 44 Days [44天]	\$141,000 (USD) 660 Days [660天]
Average Preparation Expenses (estimated) & Time 平均准备费用 (估计) 和时间	\$1,200 (USD) 40 Hours [40小时]	\$1,200 (USD) 40 Hours [40小时]	\$1,200(USD) 40 Hours [40小时]
Maintenance Fees (4 years) 维护费 (4年)	\$5,590 (USD)	\$5,590 (USD)	N/A 不适用

Key Industry Issues and Recommendations

业界主要问题和建议

- Potential delays to a product's time-to-market schedule
- Laboratory capacity – practical ability of labs to handle a large number of certification applications in timely manner given market planning and other critical needs
- Control over confidential and proprietary intellectual property and product/business confidential information
- Factory inspections and on-site sampling
- Cycle time implications for product introductions
- Post-certification supervision
- Use of only China-based test laboratories
 - Financial impact and program administration uncertainties
 - Duplicated homogeneous material testing
- 可能推迟产品的上市时间表
- 实验室能力 – 实验室及时处理基于市场计划和其他关键需求的大量认证申请的实际能力
- 控制机密和专有IP以及产品/业务方面的保密信息
- 工厂检查和现场抽样
- 产品推介的周期影响
- 获证后监督
- 使用位于中国的检测实验室
 - 财务影响和项目管理的不确定性
 - 重复的同质材料检测

Semiconductor Industry Negotiation Points (TECHAMERICA)

- **Adopt a Conformity Assurance System Based on Self Declaration & Post-market Surveillance & Enforcement**
 - While restrictive pre-market compulsory conformity certification processes may be appropriate for products or safety issues where there are immediate dangers to life and health, they are not warranted for this environmental requirement where the consumer is never directly exposed to the potentially hazardous substance.

- **Utilize International Test Methodology Standards (IEC 62321)**
 - Accept Laboratory Data Generated from a Certified Lab Regardless of its Location
 - Demonstrated by Conformance to International Lab Competence Standard (ISO/IEC 17025).

- **Remove the Factory Inspection Requirement.**
 - Factory Inspections are not Necessary for Assessing Conformity to Substance Restrictions
 - Inspections May Raise Conflicts with Foreign Government Export Control Requirements.

- **Avoid Conformity Assurance Programs which Result in the Disclosure of Supplier Proprietary Business Information**
 - Identity of Raw Materials, Supplier Names & Material Trade Names.
 - Disclosure Would Jeopardize the Company's Supply Chain Relationships Competitive Viability