Business to Business Data Exchange

Material Declaration

"Working with Stakeholders to…

Support Industry Change…

Provide Expandable Solutions (Proactive Approach)…

Do The Right Thing"

Agenda

Checkpoint

-“The Words We Say Set the Framework of our Day”

Expectations

EMS Framework

Three A’s of Supply Chain

Take Away

Checkpoint

"Risk"

"Design Requirements"

"Global Impact"

"More Complexity will Come, Not the End"

"Ask the Lawyers"

"Evolving Details"

"OEM Deadline Does Not Change"

"Open Issues"

"Due Diligence Defense"

"Inconsistency"

"State Law Autonomy"

"Harmonize"

"Unanswered Questions"

"Lack of Clarity"

Jabil CIRCUIT

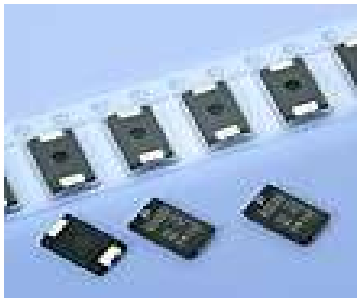
Expectations

(Reporting Requirement Ambiguity?)

Assembly Level?

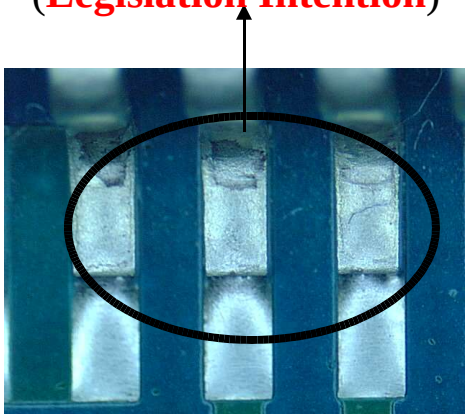
Minimal Impact-Haz Mat
SnPb Mfg Process OK
SnPb Components OK
NOT LIKELY

Component Level?



Improved Impact-Haz Mat
Pb-Free Mfg Process
SnPb Component OK
NOT LIKELY

Material Level ?
(**Legislation Intention**)



Greatest Impact-Haz Mat
Pb-Free Mfg Process
Pb-Free Component
LIKELY

***July 20th TAC (Technical Adaptation Committee) Clarification:**

A semi-conductor package contains many homogeneous materials which include; plastic moulding material, tin-electroplating coatings on the lead frame, the lead frame alloy and gold-bonding wires.

Jabil CIRCUIT

Expectations

Legislation = New Customer Requirement(s)

Challenge Existing Business Processes to Support "Greener" Product Development & Disposal

- Shift Focus From Operations (ISO 14001, EMS)
- **Design for Environment**
- End of Life Management
- True Life Cycle Assessment

Cost ($) (Resources, Materials, Capital)

Market Share Enabler (Component Manufacture to Recycler)

Must Be a 'EE" Solution - Expandable & Extendable (Not the End!)

EMS Framework

Material Declaration Strategy

- **For Us, It Started with ELV (Auto Industry IMDS)**
- Homogenous Material Level (e.g. IC platting)
- Maximum Concentration Values, % by Weight (mass required)
- Meet Tightest Requirements (e.g. full disclosure vs. partial disclosure)
- Legislative "Due Diligence" Underpinnings
- Data Aggregation - Final Product Analysis Capability
- Software Development & Resources Are Required

All Dots Must Be Connected

- **Pb-Free Manufacturing Process Compatibility (Process Temp Rating, MSL, Platting)**
- ERP & PDM Systems
- **Operational Execution (Transitional Material Control)**
- Design Services (Supporting Customer Design Specifications)
- Reverse Logistics Warranty & Repair (Spare Parts)

Can't Rely or Wait on External Forces

- Lack of Regulatory Clarity and Capricious Nature
- Speed of Standardizations
- **Inactivity Can Impact Market Share**

EMS Framework

Design for Environment

- DfRR - Increase % of Reuse (standardization, extend useful life) & Recycle ability (improved material selection)
- Examples; Select Plastics That Can Be Recycled, Avoid Beryllium, Use Material That Requires < Energy Consumption, Avoid Contaminating Materials
- Easy Disassembly for Improved EOL Efficiencies
- Selective Material Identification
- Closed-Loop w/ Design Services

Support our Customers Obligations

- High Regard/Commitment to Legislative Intention
- Multiple Industry & Customer Requirements
- Promote End Game Objective (Look Beyond the Trees)

EMS Framework

(Key Touch Points)

Design Outsourcing (OEM)

- Design for Environment Banned Substances (DfE)
- WEEE Obligations (Design for Reuse; Recycling)

Material Composition Reporting (OEM & Supply Chain)

- Multiple Customer/Sector Requirements
- Design Environment
- Aggregate Product Roll Up

Technology & Conversion Roadmaps – Eliminate Hazardous Materials (OEM & Supply Chain)

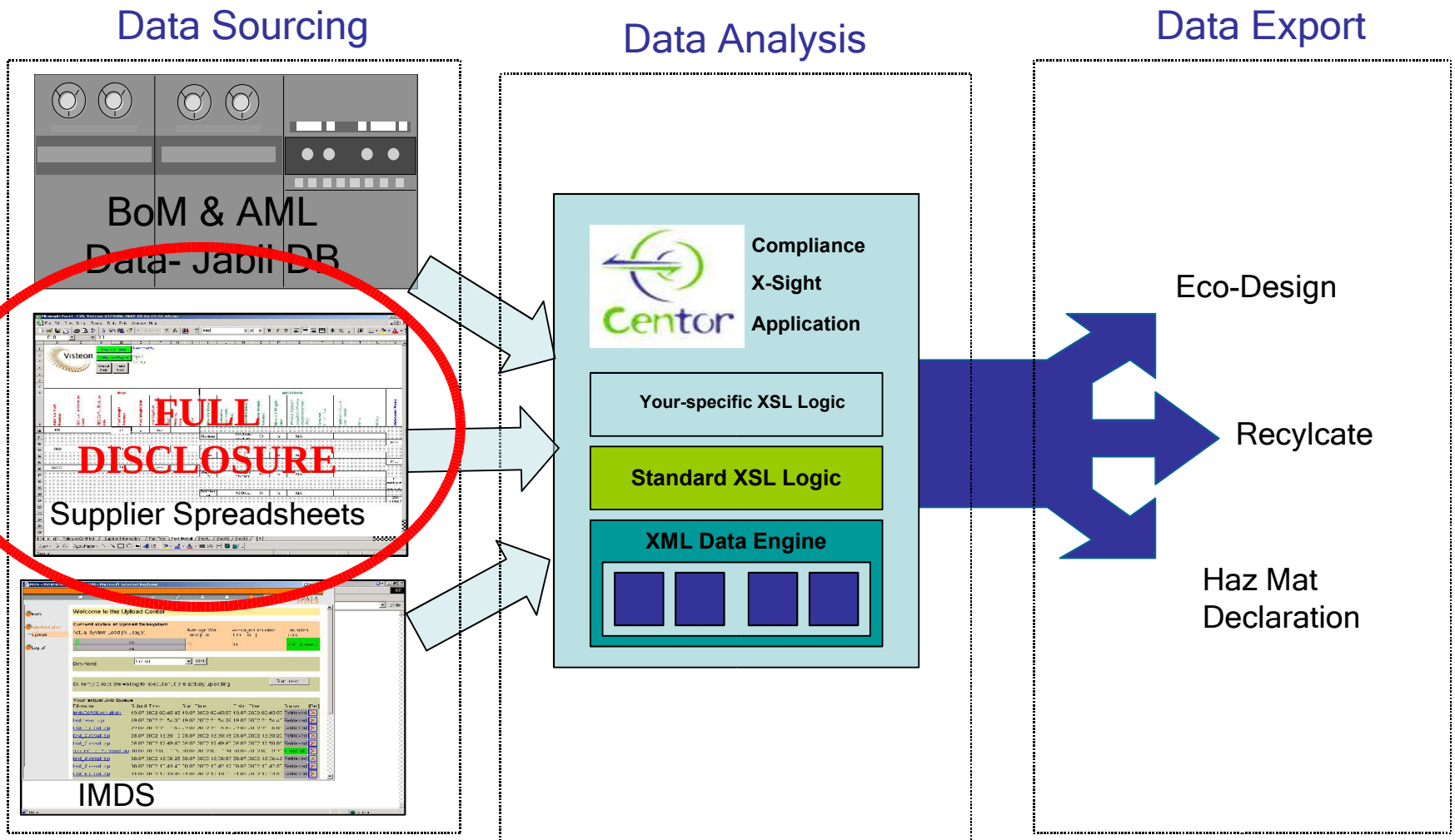
- Conversion Roadmaps (incl. Pb-free process compatibility)
- Economics & Supply Continuity Mapping

Highest Quality Assurance Practices During Transition (OEM & Supply Chain)

- Manufacturers Part Number Change

EMS Framework

(Data Exchange)



Agility

Speed of Information Exchange

- Robust IT System of Exchange (e.g. RossettaNet)
- Data Collection Channel Must be Established, Regardless of Depth of Request
- Extendable & Expandable Information Promoting Responsiveness (e.g. full disclosure)
- Accuracy of Information (e.g. due diligence)

Adaptability

Challenge Existing Business Processes to Support "Greener" Product Development & Disposal

- DfE (Design for Environment)
- IT (Information Exchange, ERP Link)
- EOL (Design for Recycling, EOL Management)
- LCA (Life Cycle Analysis)
- Extendable & Expandability (Full Disclosure, Pb-Free Process Compatibility, WEEE)
- Accuracy of Information (Full Disclosure)

Benchmark & Apply Lessons Learned (Auto Industry)

Alignment

Legislation

- Address Current Requirements (Don't Forget WEEE!)
- Consider Future Requirements (IPP, EuP)
- Due Diligence Process

External (Customer Specific)

- Multiple Substance List Reality
- Exemption Data Points & Process (Where Applicable)

Internal

- ERP & PDM System Interface (Data Aggregation)
- Mfg Process Compatibility (Pb and Pb-Free)
- Global Strategy Challenges

Industry Standardization

- JIG, Rossettnet, IPC
- Auto Industry – Logic & Lessons Learned …They did Embrace Standardization

Take Away

Alignment

- Get Beyond Denial / Waiting Stage
- Conduct Legal Review
- Get Involved (Consortia & Industry Activity)
- Lessons Learned (e.g. Automotive Industry)
- Big Picture View

Adaptability

- Business Process Change Agent
- 'EE' Expandable & Extendibility (Big Picture!)
- Accuracy & Due Diligence
- Composition Data Collection Channel Must be Established

Agility

- Leverage Expandability for Speed (one-time data collection)
- Uncertainty does not Justify Inertia
- Data Collection Channel Established Regardless of Depth of Request

Take Away

Proactive: As an EMS provider, we must consider expandable solutions that extend beyond one customer, one sector and one piece of legislation BECAUSE…

Reality: We deal with multiple customers across multiple sectors driving multiple regulatory requirements that are interpreted in multiple ways.

Collaboration: We must recognize the importance of working together while embracing change (e.g. EMSF).