



# **Supply Chain Readiness**

## **Material Disclosure Solutions**

NEMI Lead-Free Working Group

Demo and Discussion

December 9, 2003

# E-Waste Transition – Suppliers are NOT Ready !!!

**Immediate Business Problem:** Overworked corporate staff can't handle the **nightmarish data collection and data accuracy problems** being imposed upon them by the most far-reaching E-Waste legislation ever

- Pb-free assembly required by July, 2006- RoHS
- OEMs must collect data from hundreds of suppliers



Their job is **complicated** by:

- No standardized data collection format
- No standardized communication format
- No simple weight calculation tools
- Globally dispersed suppliers

**High communication time with suppliers = high costs**



# E-Waste Transition – GCG’s Immediate Solution!!!

## GCG’s Portfolio of Supplier Readiness products and services

- **Material Declaration Software**
- **Material Disclosure Workshops** that provide suppliers with
  - Compliance Awareness
  - Material Disclosure solutions
- **Turn-key Material Declaration Outsource Services**

### GCG can

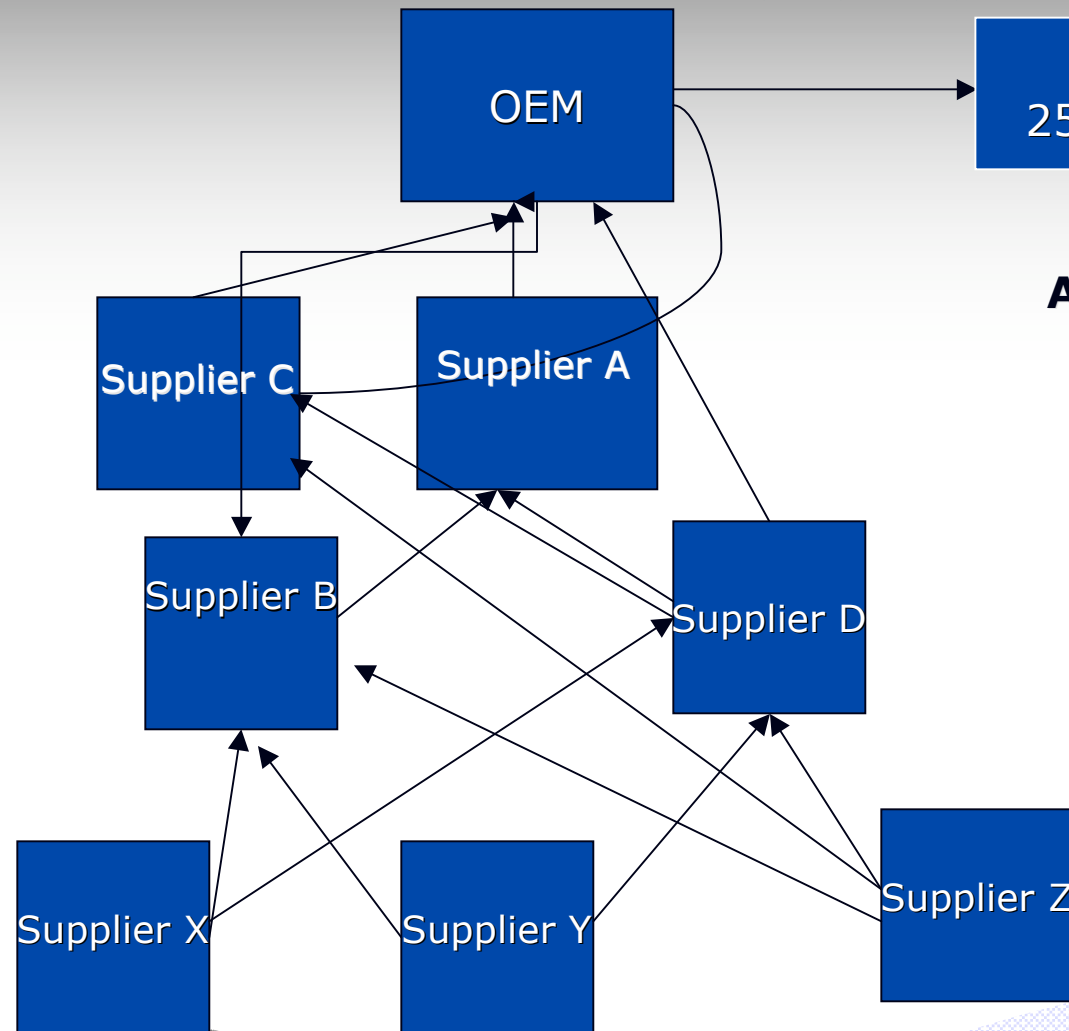
- **Make suppliers aware of regulatory drivers**
- **Standardize and automate the declaration process**
- **Provide OEM’s with accurate material disclosure information**
- **Do it all cost effectively**



# Front-End Pain: Data Collection Nightmare



25 EU Countries with  
25 Different Requirement Sets



## Apple/UC Berkeley Study:

Time needed to complete Materials Declaration for each part:

- 7.66 weeks overall
- 4.75 communications per part #

Implies 4750 communications for OEM with 1000 part #'s

Suppliers often:

- Don't know what they get from their suppliers
- Report inaccurately
- Over-report to avoid liability

# Back-End Pain: Halted shipments

## Sony Example

### Lessons from the Sony PlayStation seizure in Netherlands

- EU countries serious about toxic substance enforcement
  - Screening 30,000 chemicals
  - May require Life Cycle Analysis
- Lost revenue: approx **€110M**
- Lost market share
- Reduced brand value



#### ***Problems in Data Collection***

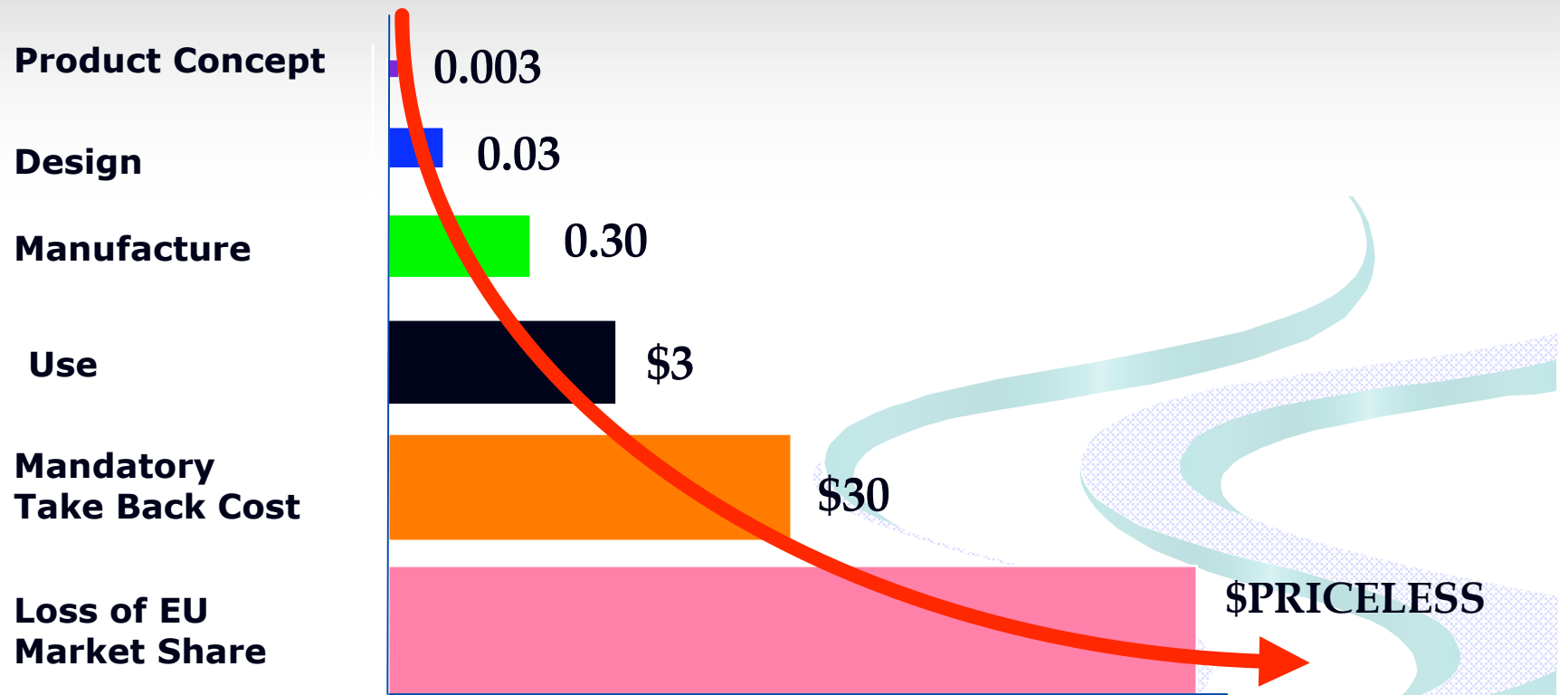
- Awareness didn't happen – supplier side
- Collection didn't happen
- Communication didn't happen
- Awareness didn't happen – producer side

#### ***NOT a problem of data management !***

- People & process issues
- Not technology issues

***Sophisticated IT solution would not have prevented it***

# Back-End Pain: Life Cycle Costs



TQM evolves to TQEM





# Material Disclosure Workshop Benefits

- **Automate** Material Declaration Process
  - Standardized: simpler, faster
  - Less errors
  - Lower costs to producer *and* supplier
    - Suppliers build product library once, for all customers
- **Access** to GoodBye Chain Group **expertise**
  - RoHS
  - WEEE
  - JIG
  - Lead-free assembly compliance
  - GCG Advisor service keeps up-to-date with changes
- **Reduce demands** on producer's own staff (e.g., component engineers)
- **Cost distributed** across supply chain
- **Audit trail** manages & reduces liability
- **Standards based** (JIG, IPC, NEMI, etc.)



# Material Declaration Software Design Drivers

- Joint Industry Guide, (JIG), Material Composition Declaration Guide (EIA/EICTA/JGPSSI)
  - Level A and Level B lists
  - Optional Level C list
- JIG Material Composition Declaration Guide (10/2003)
  - Standardized Material Declaration Format
  - Logical Information Structure
  - Information objects and fields defining content
- Material Declaration Project (IPC)
  - Calculation and analysis subgroups
- Environmentally Conscious Electronics Gap Analysis (NEMI)



The GoodBye Chain Group

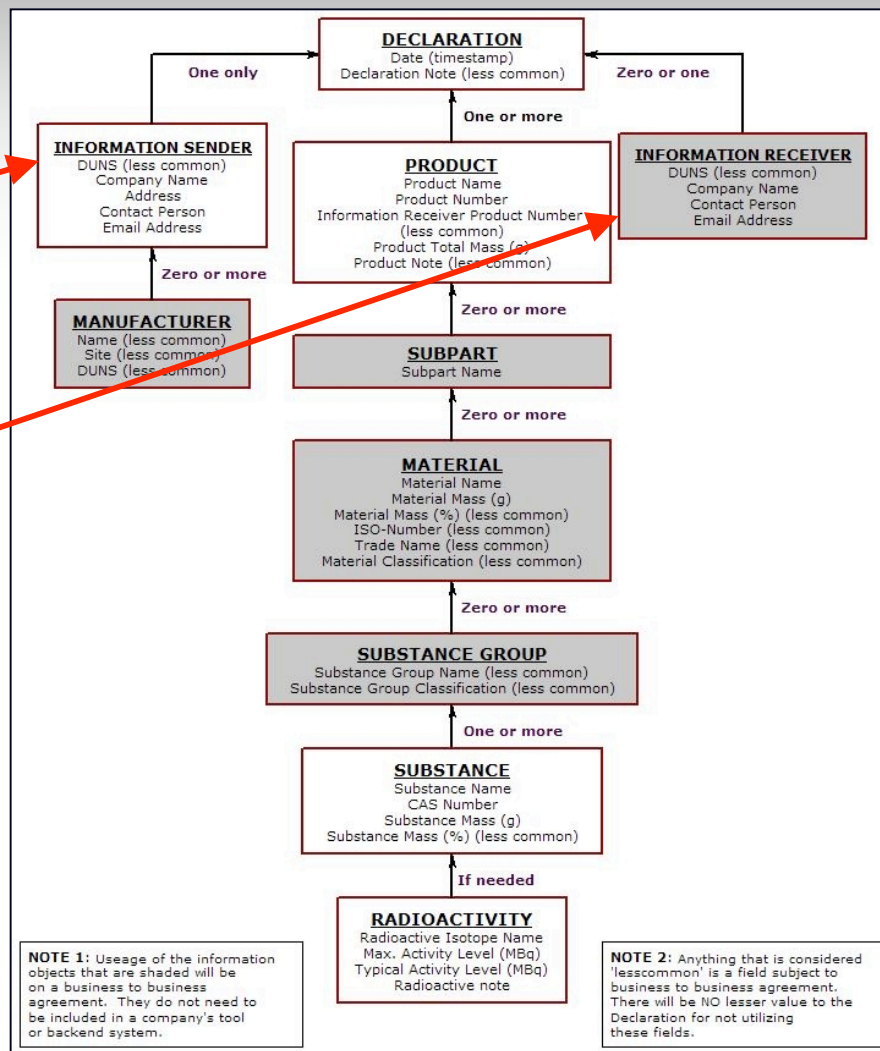
# GoodBye Chain Material Declaration Wizard

## JIG Logical Information Structure

**Information Sender**

**Manufacturer**

**Information Receiver**



**Declaration**

**Product**

**Subpart**

**Material**

**Substance Group**

**Substance**

**Radioactivity**

# 3 Easy-to-Use Steps



## 1. Determine what you need to declare

- RoHS substances
- JIG "A", "B" and "C" Lists
- Lead-free solder assembly standards

## 2. Complete a Material Declaration Form (MDF)

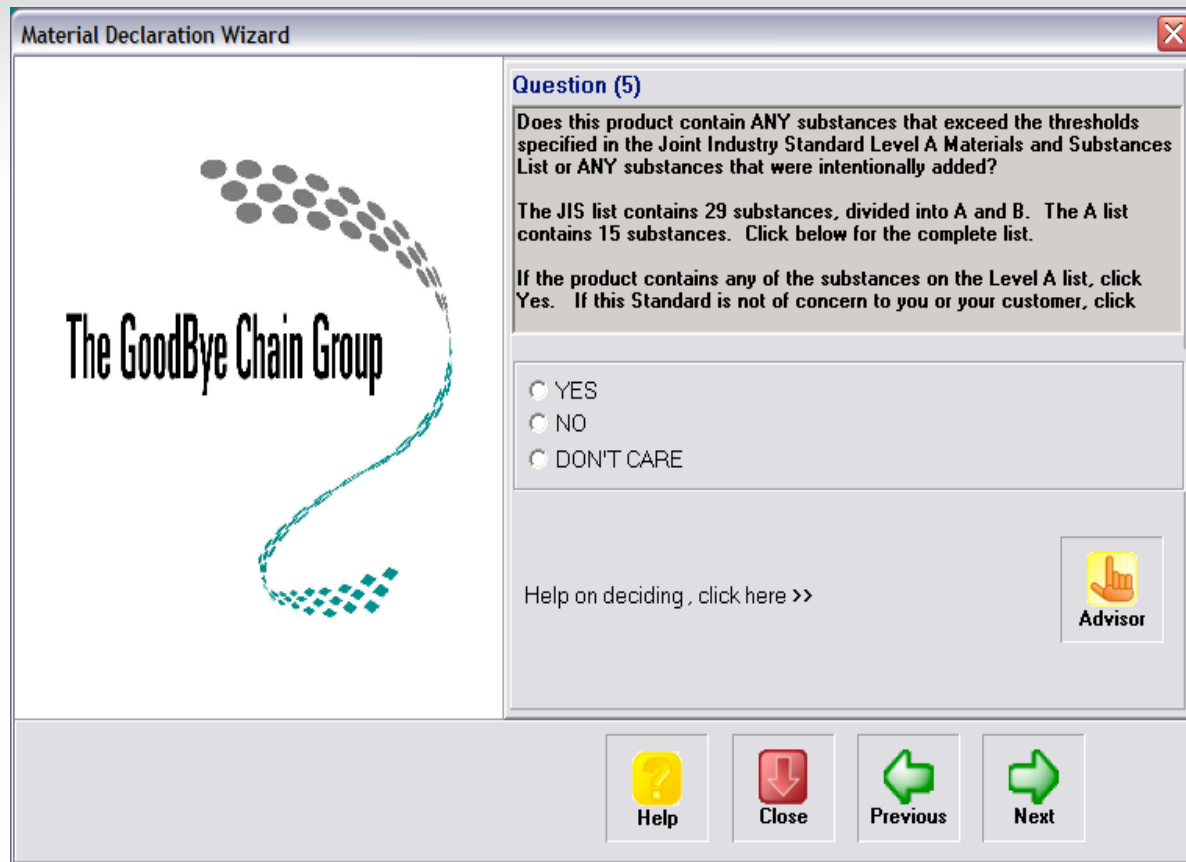
- Hierarchical product "tree"
- From substance level up
- Store in your One-View Product Library

## 3. Certify and send your MDF

- Check the certification box
- Export it in .pdx or any other format
- Track the email audit trail



# Step 1: Determine What You Need to Declare



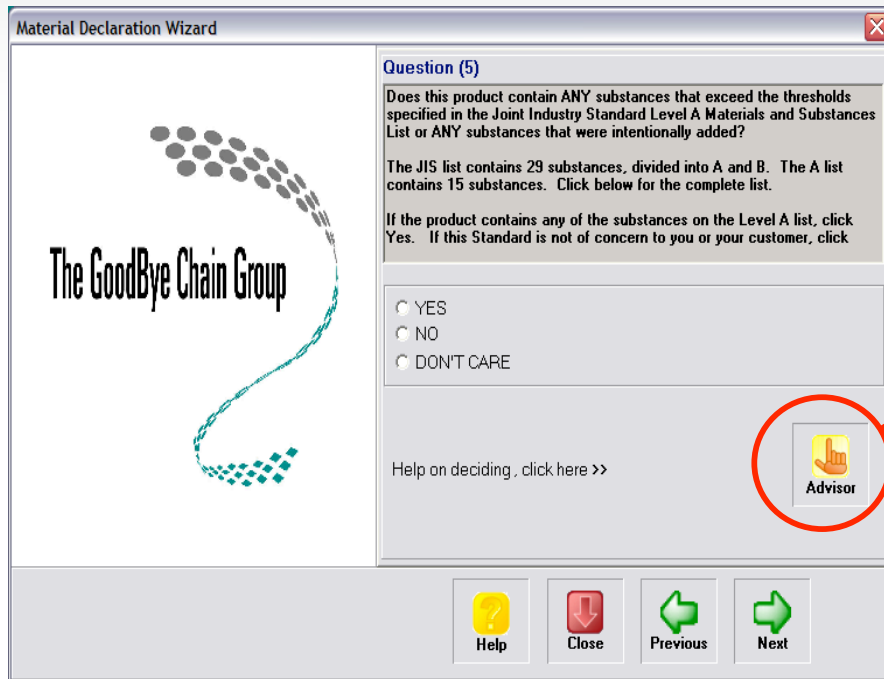
The screenshot shows a software window titled "Material Declaration Wizard". On the left side of the window is the logo for "The GoodBye Chain Group", which consists of the text and a stylized graphic of a chain of dots forming a curve. The main content area is titled "Question (5)" and contains the following text: "Does this product contain ANY substances that exceed the thresholds specified in the Joint Industry Standard Level A Materials and Substances List or ANY substances that were intentionally added?" Below this is a sub-section: "The JIS list contains 29 substances, divided into A and B. The A list contains 15 substances. Click below for the complete list." Another sub-section follows: "If the product contains any of the substances on the Level A list, click Yes. If this Standard is not of concern to you or your customer, click No." There are three radio button options: "YES", "NO", and "DON'T CARE". At the bottom right of the question area is a button labeled "Advisor" with a hand icon. Below the question area is a link: "Help on deciding, click here >>". At the bottom of the window is a navigation bar with four buttons: "Help" (with a question mark icon), "Close" (with a red arrow pointing down), "Previous" (with a green arrow pointing left), and "Next" (with a green arrow pointing right).

- Direct questions
- Straightforward direction
- Extensive Help

# Material Declaration Advisor

## GoodBye Chain Advisor help screen

### A list substances and materials



For Level "A" list substances and materials, the threshold levels are set by the law that bans or restricts their use. Therefore, assessment as to whether the threshold level has been met must be based on the relevant legal requirements. If international law establishes a new threshold for ban or restriction purposes, this threshold will be revised accordingly. For laws that allow the presence of certain materials or substances in amounts lower than a certain "part per million" (ppm) threshold, companies should use the "ppm methodology" that is established by that law in order to determine whether disclosure is necessary. Reporting below the threshold is allowed, but not required.

"Intentionally Added" means the deliberate use in the formulation of a product or subpart where its continued presence is desired in the final product or subpart to provide a specific characteristic, appearance, or quality.

If a substance or material is intentionally added, then it needs to be reported regardless of its content level. If the substance or material is otherwise present, then its threshold level applies.

Where metals are listed in Annex A, they require reporting of the metal in the metal alloys, e.g. Lead/Lead Compounds also includes reporting of the Lead content in the Lead alloy.

Note: Substances and materials are listed by group. However, in some cases where only a subset are regulated, please refer to Annexes E and F for details.

#### Material/Substance Threshold level

<a href="#">Cadmium /Cadmium Compounds</a>	75 ppm or Intentionally added
<a href="#">Hexavalent Chromium</a>	1000 ppm or Intentionally added
<a href="#">Lead/Lead Compounds</a>	1000 ppm or Intentionally added
<a href="#">Mercury/Mercury Compounds</a>	1000 ppm or Intentionally added
<a href="#">Ozone Depleting Substances</a> (CFCs, HCFCs, HBCFCs, carbon tetrachloride, etc.)	Class I: Intentionally added Class II - HCFCs: 1000 ppm
<a href="#">Polybrominated Biphenyls (PBBs)</a>	1000 ppm or Intentionally added
<a href="#">Polybrominated Diphenylethers (PBDEs)</a>	1000 ppm or Intentionally added
<a href="#">Polychlorinated Biphenyls (PCBs)</a>	Intentionally added

## Step 2: Create a Material Declaration Form

**Product Structure**

- SMD Diode in glass package
  - Lead Frame
    - Copper S/Pb Plating
      - Lead
      - Tin
      - Copper
    - Chip
      - Doped Silicon
      - Silicon
      - Aluminum
    - Glass
      - Lid Silicate
        - Lead
        - Silicon
    - Lead finishing
      - Tin/Lead
      - Lead
      - Tin

**Product information**

Name: SMD Diode in glass package  
Customer Prod. #: J64x7  
Supplier Prod. #: MELF 0023  
Total Mass: 1.371g Piece  
Location: on pcb board  
Rev. Level:   
Rev. Date: 11/ 9/2003  
Product Note:   
  
**Declaration information**

Author: Bob Brown  
Date: 09-Nov-2003  
Note:   
  
Buttons: Add Subpart, Add Material, Add Substance, Help, Close, Calc PPM, Update

- Hierarchical tree structure  
Product  
Subparts  
Materials  
Substances

- Tree advantages:
  - Easier to pinpoint problem parts
  - Mimics design
  - Design-for-Environment tool
  - Life Cycle Analysis tool

- Automatic parts-per-million substance calculation

## Step 3: Certify and Send Your MDF




**Product Certification**

I certify that I am authorized to declare this Material Declaration Form on behalf of my company; that this product was produced by my company; that if this product was produced using parts from another company that I am responsible for the truth and accuracy of all declaration and disclosure information specific to those parts in addition to my own parts; that all substance absence or presence declarations are true and accurate; that all parts per million threshold declarations are true and accurate; that all intentionally added substance declarations are true and accurate; that all lead free assembly declarations are true and accurate; that all other information represented in this Material Declaration is true and accurate; that all statements made on information and belief are believed to be true; and further that these declarations are made with the knowledge that willful false statements are punishable by fine or imprisonment, or both; and that such willful false statements may jeopardize the validity of this Material Declaration or any and all contractual agreements between my company and the Material Declaration recipient company.

Product:

Certified By:

Date:

 Help     Close     Certify

# Supplier / OEM Product Library

A	B	C	R	S	Product Name	Producer Prod. #	Supplier Prod. #	Date	Author
●	⊘	⊘	⊘	⊘	SMD Diode in Glass Packages	DI04599	895001	24-Oct-2003	Tim Harris
●	●	●	⊘	⊘	Hard Drive 120 GB Serial ATA...	HD45890	789354ee	26-Oct-2003	Bob Brown
●	●	●	⊘	⊘	Motherboard pentium 4-478	MM65554	878765R1	26-Oct-2003	Tom Morgan
●	●	●	⊘	⊘	Power Transformer, VA, 120 ...	PW009876	236744K	26-Oct-2003	Tom Ruby

**A** JIS "A List" Compliant  
**B** JIS "B List" Compliant  
**C** "C List" Compliant  
**R** RoHS Compliant  
**S** Pb-Free Assembly tested

**Legend:**  
● Compliant parts  
⊘ Non-compliant parts

Quickly indicates  
compliant parts ●

and non-compliant  
parts ⊘

*Suppliers* – create library of parts **once** for declarations to multiple customers

*Back End Integration* – Material Declaration data structure can be exported in any data format- IDOC, PDX, RosettaNet, flat file etc.

# Simple ROI calculation

## Assumptions

- OEM has 20,000 part numbers
- 6 RoHS substances (presence/absence)
- 15 A List substances (ppm thresholds)
  
- Without GCG Material Disclosure Solution:
  - 4.75 (avg) communications / part (Apple/Berkeley study)
  - x 15 mins per communication
  - x \$29/hour administrator's time
  - = **\$34 / part**
  
- With GCG Material Disclosure Solution:
  - 2 communications / part (estimate)
  - = **\$14.50 / part**



# Simple ROI Calculation

20,000 Product/Part Numbers @ \$34 each	\$680,000
Loss of Productivity of OEM collection Resources	\$???????
Total cost of OEM collection program	\$680,000 + ???
Cost: using GCG's MDW Solution. @ 14.50 each	\$290,000
Total OEM Savings	<b>\$390,000</b>



## MDW Summary

- Simplifies a very complex problem
  - Standards-based application
  - Supply chain-centric vs. corporate-centric
  - Extensive application and Advisor Help
- Substantially reduces cost
  - All suppliers can afford it
  - Avoid \$800,000+ custom application development
  - Distributes cost across the supply chain
- Saves time
  - Easy to use
  - Extensive hands-on training in Workshop
  - Create one MDF – distribute it to many customers
- Strengthens the supply chain rather than stressing it
- Turns “mere compliance” into competitive advantage



# Material Declaration Wizard

## DEMO

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The GoodBye Chain Group

