



# NEMI RoHS Summit

## Component Supplier Issues

### with B2B Data Exchange update

**Mark Frimann**  
**Texas Instruments**  
**19 Oct 2004**



TI  
SPECS

CUSTOMER  
SPECS

PACKAGING

PRODUCT CONTENT

Pb-free Green

ES  
LEGAL



# Skill Requirements

- **ESH and Legal considerations**
  - RoHS, EoLV, WEEE, customer specs & Legal requirements
- **Understand Internal Data - Eco-Info website knowledge**
  - [www.ti.com/productcontent](http://www.ti.com/productcontent)
- **Understand Pb-free, Green and other banned material requirements and conversion schedules**
  - RoHS, EoLV, EIA/EICTA/JGPSSI Joint Industry Guide (JIG), Sony SS00259, Green, others
  - Pb-free & Green conversion schedules
- **Package understanding for product**
  - Internal conversion schedules vs external requirements
- **Understand what the customer is asking and responding with what they need**
  - Interpreting forms
  - Understanding specs
- **Fill out customer forms**
  - Create templates where applicable
  - Excel, Word, PDF, Web-Based, customer special
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# Customer Expectations

- **Must be in their format**
  - Excel, Word, PDF, Web, custom
- **May be a mixture of forms**
- **Requesting information outside of Substance Reporting**
- **Information required by some customers**
  - Before sales and/or
  - To continue purchasing
- **Compliance**
  - ICP types of forms
- **Signatures**



# **Business Process Changes Required to Meet RoHS/WEEE**

- **Not an option**
  - **Either you are in or you will be out**
- **Affects all businesses within a company**
  - **Planning/Purchasing**
  - **Packaging and Packing**
  - **Sales and Support**
  - **Design**
  - **Environmental, Safety and Health**

## **Data**

- **Collection and storage**
- **Updating**
- **Provide to customers**



# Expectations from Supply Chain Partners & Standards used

- **100% disclosure**
  - Fill in forms sent to them
  
- **Meet Regulatory Requirements**
  - **EU Directives**
    - RoHS, EoLV, WEEE, etc
    - Other regulatory bodies
  - **JIG**
    - First cross-regional document covering Europe, Japan & North America



# Critical Issues

- **Reporting forms and formats**
  - **Ease of information exchange**
- **Companies developing requirements that differ from established regulations**
  - **PPM values**
  - **Substance lists**
- **US – no established regulatory body like EU**
  - **Each state developing their own**
- **Decisions based on politics, not on facts**
- **Businesses must be involved with these requirements**



# RosettaNet 2A13 Efforts

- TI is working with Nokia to run B2B transactions using the RosettaNet 2A13 format.
- Current status
  - TI is working to send the first 50 devices and info to Nokia
  - Issues seen to date are not PIP related but getting the data into the format required for the PIP
  - Should start seeing first results by the end of October.



# Supporting Slides



# Meeting the requirements of Lead-free, RoHS and Green

## What does that mean?

Mark Frimann  
Texas  
Instruments  
13 Oct 2004



# Meeting the requirements of Lead-free, RoHS and Green

- As new requirements are being added from all regions of the world, company definitions of Lead-free, RoHS and Green compliant are becoming less clear.
  - What does Lead-free mean?
  - What does RoHS compliant mean?
  - What does Green compliant mean?



# Base Definition of Lead Free, RoHS Compliant and Green Compliant for TI

1. **Lead-free** = Lead content  $\leq$  1000ppm
  2. **RoHS compliant** = Cadmium content  $\leq$  100ppm  
= Lead, Mercury, Hexavalent Chromium, PBB & PBDE content  $\leq$  1000ppm
  3. **Green compliant** = Antimony & Bromine content  $\leq$  1000ppm  
= plus meet all RoHS requirements
- This is the barebones meaning of each. As companies work to meet these requirements, other items are being added
    - 260C reflow processes
    - Other substances of concern (JIG and/or company defined)
    - Company specific definition for “Lead-free”, “RoHS” and “Green”
  - “Green” could mean RoHS compliant or may include many other requirements. This is where “Green” gets muddled.



# Umbrella Definitions

- The following slide shows more of an “umbrella” definition for each.
- The Lead-free resides under RoHS which is under the Green policy umbrella.
- Each umbrella includes a base definition plus an underlying assumed definition.
  - Green also contains a “may include” section.



# Pb-free, RoHS & Green Umbrella Policies

## GREEN

### Required (defined by customer):

- RoHS plus
- Company defined Green requirements

### Assumed:

- 250C to 260C reflow (JESD-020B)
  - Moving to 260C (JESD-020C)
- Plus other company defined substances
- Conformance documents

## ROHS

### Required:

- Pb-free plus
- Mercury <=1000ppm
- Hex. Chrom.<= 1000ppm
- PBB <= 1000ppm
- PBDE <= 1000ppm
- Cadmium\* <= 100ppm

### Assumed:

- 250C to 260C reflow (JESD-020B)
  - Moving to 260C (JESD-020C)
- Plus other company defined substances
- Conformance documents

### May Include:

- Though not a required regulation
  - Antimony <= 1000ppm
  - Bromine <= 1000ppm
- WEEE (waste management)

## Pb-Free

### Required:

- Lead <=1000ppm

### Assumed:

- 250C to 260C reflow (JESD-020B)
  - Moving to 260C (JESD-020C)
- Part number? Release date?

Note: \* Cadmium threshold per JIG is 75ppm



# How is this handled with Texas Instruments Products?

- **Within Texas Instruments, devices that are Pb-free mean**
  - They are Lead-free
    - Lead  $\leq$  1000ppm
  - They are RoHS compliant
    - Lead, Mercury, Hexavalent Chromium, PBB, PBDE  $\leq$  1000ppm
    - Cadmium  $\leq$  100ppm
  - They are rated at 250C to 260C reflow for SMT devices
- **Green compliancy of Antimony and Bromine being  $\leq$  1000ppm is not a requirement in any EU regulation, nor has it been seen in other governing body regulation.**
  - Though not a requirement, TI is moving its products to Green
    - Green means meeting all requirements under “Pb-free”
    - Reflow is at 260C only, to meet the latest JESD-020C requirements
    - Plus the requirements for Antimony & Bromine  $\leq$  1000ppm
- **Answering customer questions and forms**
  - TI reviews customer requirements and specs
  - Responds back to their questions and forms as needed
- **TI bases its responses from its Product Content database externally available at [www.ti.com/productcontent](http://www.ti.com/productcontent).**



# TI Product Content Information

TI Part Number	SN74LVC04ADÊ	Assembly Site	TI MALAYSIA A/TÊ
Current Finish	CU NIPDAU	Package Type / Pins	D I 14Ê
Lead (Pb)-Free Orderable	YÊ	MSL Rating/ Peak Reflow	Level-2-260C-1 YEAR/Level-1-235C- UNIMÊ
Lead (Pb)-Free Conversion Date	01-Aug-2003Ê	Green Orderable	NÊ
RoHS Compatible	YÊ	Green Conversion Date	
Package Body Size (W x L x H) mm	3.91X8.65X1.58Ê	Package Total Mass (g)	0.128Ê

Lead (Pb)-Free PCN Release Date		Lead (Pb)-Free Initial	
Lead (Pb)-Free Assured Supply Date	28-Jan-2004Ê	Lead (Pb)-Free Finish	

Green PCN Release Date	30-Jun-2004Ê	Green Initial Supply Date	30-Oct-2004Ê
Green Assured Supply Date	28-Jan-2005Ê		

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<b>Bond Wire</b>		<b>Subpart sum:</b>		<b>0.100002</b>	
Metallurgy	Gold	7440-57-5Ê	0.099	0.0773	772 989980
Trace Metal	Beryllium	7440-41-7Ê	0	0	0 0
Trace Metal	Calcium	7440-70-2Ê	0.000002	0	0 20
Trace Metal	Copper	7440-50-8Ê	0.00015	0.0001	1 1500
Trace Metal	Palladium	7440-05-3Ê	0.00085	0.0007	7 8500
Trace Metal	Silver	7440-22-4Ê	0	0	0 0

Component	Substance	CAS Number	Amount of Substance(mg)	Percentage %	ppm	Subpart sum
<b>Die Attach Adhesive</b>		<b>Subpart sum:</b>		<b>0.070000</b>		
<b>Conductive Material</b>	<b>Silver</b>	<b>7440-22-4</b>	<b>0.049</b>	<b>0.0383</b>	<b>383</b>	<b>700000</b>
<b>Polymer</b>	<b>Epoxy</b>		<b>0.0091</b>	<b>0.0071</b>	<b>71</b>	<b>130000</b>
<b>Polymer</b>	<b>Proprietary Resin</b>		<b>0.00385</b>	<b>0.003</b>	<b>30</b>	<b>55000</b>
<b>Reactive Diluent</b>	<b>Proprietary Material</b>		<b>0.00805</b>	<b>0.0063</b>	<b>63</b>	<b>115000</b>
<b>Lead Frame</b>		<b>Subpart sum:</b>		<b>40.500001</b>		
<b>Base Metal</b>	<b>Copper</b>	<b>7440-50-8</b>	<b>39.394774</b>	<b>30.7772</b>	<b>307772</b>	<b>972710</b>
<b>Base Metal</b>	<b>Iron</b>	<b>7439-89-6</b>	<b>0.970464</b>	<b>0.7582</b>	<b>7582</b>	<b>23962</b>
<b>Base Metal</b>	<b>Lead</b>	<b>7439-92-1</b>	<b>0.012131</b>	<b>0.0095</b>	<b>95</b>	<b>300</b>
<b>Base Metal</b>	<b>Phosphorus</b>	<b>7723-14-0</b>	<b>0.006065</b>	<b>0.0047</b>	<b>47</b>	<b>150</b>
<b>Base Metal</b>	<b>Tin</b>	<b>7440-31-5</b>	<b>0.012131</b>	<b>0.0095</b>	<b>95</b>	<b>300</b>
<b>Base Metal</b>	<b>Zinc</b>	<b>7440-66-6</b>	<b>0.040436</b>	<b>0.0316</b>	<b>316</b>	<b>998</b>
<b>Plating</b>	<b>Gold</b>	<b>7440-57-5</b>	<b>0.000499</b>	<b>0.0004</b>	<b>4</b>	<b>12</b>
<b>Plating</b>	<b>Nickel</b>	<b>7440-02-0</b>	<b>0.060877</b>	<b>0.0476</b>	<b>476</b>	<b>1503</b>
<b>Plating</b>	<b>Palladium</b>	<b>7440-05-3</b>	<b>0.002624</b>	<b>0.002</b>	<b>20</b>	<b>65</b>
<b>Mold Compound</b>		<b>Subpart sum:</b>		<b>86.280002</b>		
<b>Coloring</b>	<b>Carbon Black</b>	<b>1333-86-4</b>	<b>0.25884</b>	<b>0.2022</b>	<b>2022</b>	<b>3000</b>
<b>Filler</b>	<b>Fused Silica</b>	<b>60676-86-0</b>	<b>63.847202</b>	<b>49.8806</b>	<b>498806</b>	<b>740000</b>
<b>Flame Retardant Additive</b>	<b>Antimony Oxide</b>	<b>1309-64-4</b>	<b>1.7256</b>	<b>1.3481</b>	<b>13481</b>	<b>20000</b>
<b>Flame Retardant Polymer</b>	<b>Brominated Epoxy</b>		<b>1.7256</b>	<b>1.3481</b>	<b>13481</b>	<b>20000</b>
<b>Hardener</b>	<b>Phenolic Novolac</b>		<b>5.1768</b>	<b>4.0444</b>	<b>40444</b>	<b>60000</b>
<b>Other additives</b>	<b>Catalyst Mold Release Adhesion Agent</b>		<b>0.77652</b>	<b>0.6067</b>	<b>6067</b>	<b>9000</b>
<b>Polymer</b>	<b>Cresol Novolac Epoxy</b>		<b>12.5106</b>	<b>9.7739</b>	<b>97739</b>	<b>145000</b>
<b>Stress Relief Agent</b>	<b>Silicone</b>		<b>0.25884</b>	<b>0.2022</b>	<b>2022</b>	<b>3000</b>
<b>Semiconductor Device</b>		<b>Subpart sum:</b>		<b>1.09</b>		
<b>Silicon Chip</b>	<b>Doped Silicon</b>	<b>7440-21-3</b>	<b>1.09</b>	<b>0.8516</b>	<b>8516</b>	<b>1000000</b>
<b>Sum</b>				<b>100</b>	<b>1000000</b>	