RoHS-legislation Impact on your connector needs

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FCI has been involved in the development and manufacturing of lead-free interconnect components since many decades

Since 1997/1998 FCI has actively been involved in the Research and Development of lead-free interconnect solutions using non lead containing tin based platings and solders

RoHS-legislation

- Restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS)
- Target date: July 1st 2006
- Substances and maximum concentration values:

Lead	0.1% by weight
Mercury	0.1% by weight
Hexavalent Chromium	0.1% by weight
Polybrominated Biphenyls (PBB)	0.1% by weight
Polybrominated Diphenyl Ethers (PBDE)	0.1% by weight
Cadmium	0.01% by weight

- Thresholds are defined by amendment and are valid for homogenous materials
- Exempt list defined by Annex and currently under review

Impact of RoHS on connector industry

TARGETS FOR CONNECTOR INDUSTRY

- Find lead-free alternative for traditional tin-lead plating
- Assure no other restricted substances are present in products
- Manage transition (internally + externally)

COMPLEXITY

Not everyone is on the same time schedule

AND IN THE MEANTIME

 Need to keep supplying traditional versions to customers with exempt

FCI solutions

FCI has developed a path forward that is flexible to customers and meets the targets of the RoHS.

FCI solutions are easy to understand and developed to meet your requirements

FCI solutions are throughly tested and qualified to meet the most critical demands

FCI's path to Reliable Lead-Free Components

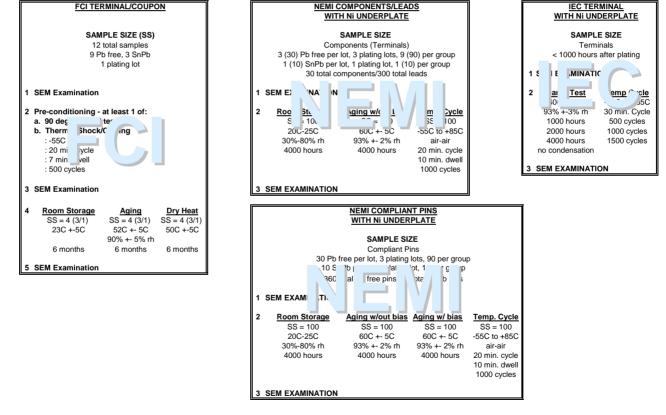
Selection of best globally available bath(s)

Whisker propensity	Bath maintainability
Cost	Technical support
Termination style performance	Deposit performance

- FCI lead-free plating: Matte pure tin on Nickel underlayer
- Understanding impact of plating finish change on connectors
 Increased processing temperature in solder process
 Possible changes in termination style performance
 Understanding forward / backward compatibility
 - FCI has tested connector housings under real-life process temperatures
 - FCI has re-qualified all termination styles on the impact of the plating change
 - FCI has tested forward / backward compatibility on all plating surfaces and with all termination styles

FCI Whiskers testing

- Early 2003 a common whisker test method was developed by the Connector Collaboration Team (FCI, Molex, Tyco, Amphenol)
- Recently NEMI and IEC have developed standards for whisker testing



FCI is now testing the variances between these different tests

FCI test conditions are amongst the most severe in the industry



FCI Qualification testing

Many different elements of connector terminations have been re-qualified:

Solderability Solder joint reliability Compliant pin process conditions Compliant pin reliability Mechanical shock and vibration High temperature storage Tin whisker growth after termination Moisture sensitivity level Compatibility (forward / backward)

• Overview of FCI Termination styles:

Solder	Press-fit	CTW
- reflow	- H-shape	IDC
- wave - BGA		Separable Interface
- hand		Wire-Wrap

FCI has made lead-free easy

FCI RoHS-compatible products get new part number

Lead-free	Product does not contain any lead above the threshold
RoHS-compliant	Product does not contain any restricted substances above the threshold
RoHS-compatible	Product is RoHS-compliant and has been qualified to meet the lead-free termination process conditions for which it was developed

New partnumber = Current part number + LF

- Current part number remains available
 - To support customers with exempt position
 - To support customers with different implementation schedules

Lead-free shipments are clearly labeled on the packaging

Directive 2002/95/EC Compliant Directive 2002/95/EC Compatible



FCI roadmap to lead-free

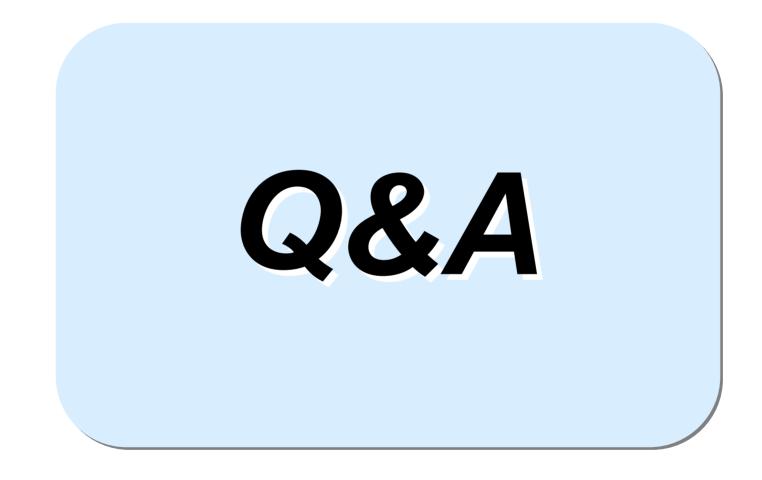
The FCI-way to lead-free is making it easy for customers

- No customers have the same requirements
- No customers are on the same timeline
- FCI has developed a very flexible transition approach
- Almost all FCI products can be made available in a lead-free and RoHS-compatible version
 - per January 2005, depending on customer need
- To assure your product is available in time, please contact your FCI sales representative and give them your target dates and your requested volumes
- FCI product focus teams are ready to meet your schedule
 - Internal procedures are available
 - Critical issues have been qualified

FCI lead-free products

Easy to make the change

Easy to identify in your process



What plating is FCI recommending?

- FCI standard option for lead-free plating is matte pure tin on a nickel underlayer (thickness specified on the drawing)
- Alternative platings qualified or under test with FCI:

Bright pure tin	Qualified for shields and accessories (mainly barrel plated products)
Hot dip tin	Qualified for products w/o nickel underlayer (mainly used in Automotive)
Tin-Bismuth	Under test for special applications only
2 layer tin	Under test for special applications only
Reflowed tin	Under test for special applications only

FCI is using only preferred and qualified baths

Q & A

What process temperature can FCI products meet?

- FCI products are developed and qualified to meet specific termination process conditions. For lead-free these conditions are specified on the customer drawing. Each condition is verified by means of standard testing procedures
- Some examples:
 - Reflow: 245C & 260C
 - Wave: 260C
 - Press-fit: various lead-free board materials & various hole diameters
- Max process temperature and applied test conditions are specified on the engineering documentation
- Customer process conditions may deviate from applied test conditions

What is the new FCI RoHS-compatible lead-free part number?

Lead-free part number = current part number + LF

6801500-001 becomes 6801500-001LF

- In case a part number already has +16 characters, a new part number will be assigned, again ending with LF
- Also products that use non-tin based platings get a new part number when they are defined and documented to meet the RoHS-requirements
- The LF at the end of any FCI part number uniquely identifies this FCI product to be RoHS-compatible and lead-free
- Current part numbers remain available for customers that have continued need for tin-lead plated products

How can I get FCI lead-free products?

- Contact your FCI sales representative and inform them of your need for FCI lead-free products
- In case you have a specific date for availability of the products, assure your contact person is aware of that
- Your contact will communicate your need and verify availability of the requested product with the FCI product focus teams

NO ORDERS = NO BUSINESS

this old rule has not changed with lead-free

The FCI-way

RoHS made easy