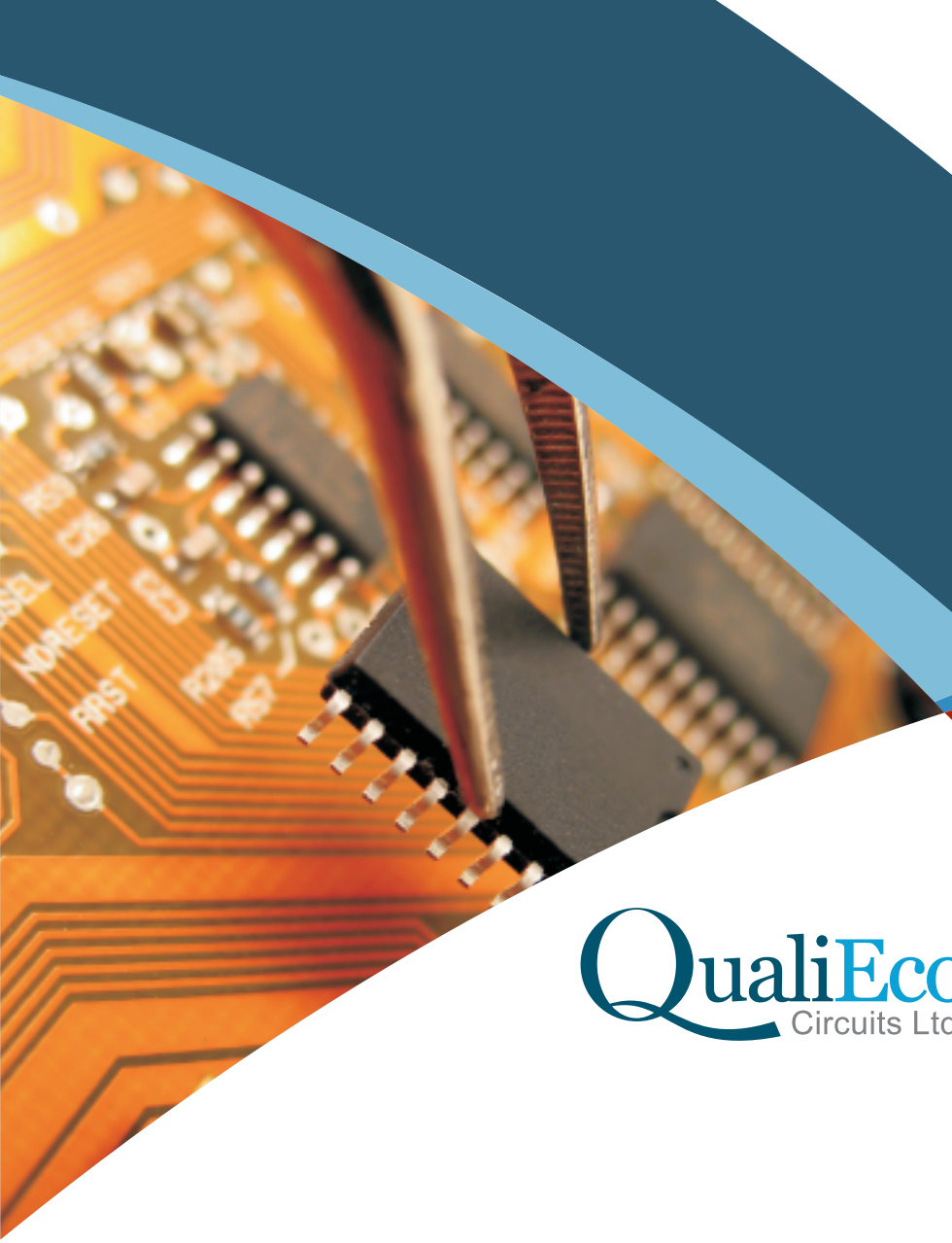
The Best Quality PCB Supplier



QualiEco Circuits Ltd.

PCB Supplier of
the Best Quality, Lowest Price
and Reliable Lead Time

- Low Cost Prototype
- Standard Prototype & Production
- Stencil
- PCB Design

Visit us: www.qualiecocircuits.co.nz

RoHS: Restriction of Hazardous Substances Compliance

ROHS: RESTRICTION OF HAZARDOUS SUBSTANCES

QualiEco Circuits Ltd. has been supplying RoHS complied PCBs as an option to our valuable customers for last few years.

Apart from standard leaded PCBs, we have **Lead-FREE HASL, Immersion SILVER, Immersion GOLD** and **Immersion TIN** finish options to cater the requirements of PCB designs that need RoHS compliance.

Check the comparison chart to help you choose correct surface finish for your RoHS requiremen:

- Comparison in General
- Comparison in Detail

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COMPARISON IN GENERAL:

Immersion Silver (Iag)	Electroless Nickel Immersion Gold (ENIG)	Immersion Tin (Isn)
• World renowned chemistry • Thickness offered 0.25 micron to 9.4 micron.	• Fully automatic line. • World renowned chemistry. • Thickness offered 3-4 micron Nickel, 0.1 micron Gold.	• World renowned chemistry • Thickness offered up to 1 micron.
WHY? • Environment Friendly. • Complying with all RoHS requirement. • Suitable for fine pitch assembly and reflow soldering. • Shelf life is 2.5-3 months. • Multiple solderable. • Provides enough room for accurate stencil making in assembly requirement.	**WHY?** • Environment Friendly. • Complying with all RoHS requirement. • Suitable for fine pitch assembly and reflow soldering. • Very long solder life. • Multiple solderable. • Most suitable for wire bonding application.	**WHY?** • Environment Friendly. • Complying with all RoHS requirement. • Widely accepted surface finish. • Excellent solderability. • Highly acceptable to all solder paste and fluxes.
APPLICATONS • SMT processes. • Computers & Peripherals • Communications • Consumers electronics	**APPLICATONS** • Spring contacts. • Aluminium Wire bonding • SMT processes • Computers • Mobile phone communications • Consumer electronics • Automotive	**APPLICATONS** • SMT processes • Computers • Mobile phone communications • Automotive • Press fit applications and back panels

RoHS: Restriction of Hazardous Substances Compliance

COMPARISON IN DETAIL:

Final Plating Finish Comparisons

	HASL (SnPb)	HASL Lead-Free	Electroless Nickel Immersion Gold - ENIG	Immersion Silver-IAg	Organic Solderable Coatings - OSP	Immersion Tin - ISn	Electrolytic Nickel Gold -NiAu
RoHS Compliant	No	Yes	Yes	Yes	Yes	Yes	Yes
Fabrication Costs	Low	Low	Medium	Medium	Low	Medium	High
Shelf Life	1 Year	1 Year	1 Year	2.5-3 Months	2.5-3 Months	2.5-3 Months	1 Year
Assembly Cycle Capacity	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple
Multiple Rework Capacity	Limited	Limited	Limited	Yes	No	No	No
Solder Wettability	Excellent	Good	Good	Very Good	Good	Good	Good
Co-planarity	Poor	Good	Excellent	Excellent	Excellent	Excellent	Good/Poor
Solder Joint Integrity	Excellent	Good	Good	Excellent	Good	Good	Poor**
Low Resistance/ High Speed	No	No	No	Yes	N/A	No	No
Aluminium Wire Bond	No	No	No	No	Yes	No	Yes

** Thicker applications of Au can cause embrittlement

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RoHS: Restriction of Hazardous Substances Compliance

INTRODUCTION:

- RoHS is the acronym for Restriction of Hazardous Substances. RoHS is also known as Directive 2002/95/EC, originated in the European Union and restricts the use of specific hazardous materials found in electrical and electronic products.
- The RoHS Directive and the UK RoHS regulations came into force on 1 July 2006. The RoHS Directive is an Article 95 single market directive.
- All applicable products in the EU market after July 1, 2006 must pass RoHS compliance. These products would include lead free solder, electro less nickel immersion gold, immersion silver, electroplated gold, white tin or finishes other than tin-lead solder.
- RoHS compliant boards are produced using laminate materials of varying decomposition temperatures with a number of different final finishes.
- It also provides lead-free solder finish using SN100CL – a lead free alloy of 99.3% tin/ 0.6% copper with a trace of nickel.

RoHS COMPLIANCE CATEGORIES:

- Following Product categories are **impacted** under RoHS Directive:
  - **Large household appliances:** refrigerators, washers, stoves, air conditioners
  - **Small household appliances:** vacuum cleaners, hair dryers, coffee makers, irons
  - **Computing & communications equipment:** computers, printers, copiers, phones
  - **Consumer electronics:** TVs, DVD players, stereos, video cameras
  - **Lighting:** lamps, lighting fixtures, light bulbs
  - **Power tools:** drills, saws, nail guns, sprayers, lathes, trimmers, blowers
  - **Toys and sports equipment:** videogames, electric trains, treadmills
  - **Automatic dispensers:** vending machines, ATM machines

RoHS: Restriction of Hazardous Substances Compliance

RoHS COMPLIANCE CATEGORIES:

- Following Product categories are currently **exempted** under RoHS Directive:
  - Large stationary tool
  - Control and monitoring equipment
  - National security use and military equipment
  - Medical devices
  - Some light bulbs and some batteries
  - Spare parts for electronic equipment in the market before July 1, 2006.

RoHS SPECIFIES MAXIMUM LEVELS FOR THE FOLLOWING SIX RESTRICTED MATERIALS:

- **Cadmium (Cd)**: 100 ppm
- **Mercury (Hg)**: 100 ppm
- **Lead (Pb)**: 1000 ppm
- **Polybrominated Biphenyls (PBB)**: 1000 ppm
- **Polybrominated Diphenyl Ethers (PBDE)**: 1000 ppm
- **Hexavalent Chromium (CrVI)**: 1000 ppm

RoHS compliance testing can be carried out using portable RoHS analyzers known as x-ray fluorescence or XRF metal analyzers, such from Niton and Innov-X Systems...

RoHS: Restriction of Hazardous Substances Compliance

RoHS COMPLIANCE CATEGORIES:

Following Product categories are currently **exempted** under RoHS Directive:

- **The amendment 2006/692/EC**
  Commission Decision 2006/692/EC of 12 October 2006 amending, for the purposes of adapting to technical progress, the Annex to Directive 2002/95/EC of the European Parliament and of the Council as regards exemptions for applications of hexavalent chromium (notified under document number C(2006) 4791) (Text with EEA relevance) (2006/692/EC).

- **The amendment 2006/691/EC**
  Commission Decision 2006/691/EC of Commission Decision 2006/691/EC of 12 October 2006 amending, for the purposes of adapting to technical progress, the Annex to Directive 2002/95/EC of the European Parliament and of the Council as regards exemptions for applications of lead and cadmium (notified under document number C(2006) 4790) (Text with EEA relevance) (2006/691/EC).

- **The amendment 2006/690/EC**
  Commission Decision 2006/690/EC of 12 October 2006 amending, for the purposes of adapting to technical progress, the Annex to Directive 2002/95/EC of the European Parliament and of the Council as regards exemptions for applications of lead in crystal glass (notified under document number C(2006) 4789) (Text with EEA relevance) (2006/690/EC).

- **The amendment 2006/310/EC**
  Commission Decision 2006/310/EC of April 21, 2006 amending, for the purposes of adapting to the technical progress, the Annex to Directive 2002/95/EC of the European Parliament and of the Council as regards exemptions for applications of lead (notified under document number C(2006) 1622).

- **The amendment 2005/747/EC**
  Commission Decision 2005/747/EC of October 21, 2005 amending for the purposes of adapting to technical progress the Annex to Directive 2002/95/EC of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment (notified under document number C(2005) 4054).

- **The amendment 2005/717/EC**
  Commission Decision 2005/717/EC of October 13, 2005 amending for the purposes of adapting to the technical progress the Annex to Directive 2002/95/EC of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment (notified under document number C(2005) 3754).

RoHS: Restriction of Hazardous Substances Compliance

RoHS COMPLIANCE CATEGORIES:

Following Product categories are currently **exempted** under RoHS Directive:

The amendment 2005/618/EC

Commission Decision 2005/618/EC of August 18, 2005 amending Directive 2002/95/EC of the European Parliament and of the Council for the purpose of establishing the maximum concentration values for certain hazardous substances in electrical and electronic equipment (notified under document number C(2005) 3143).

The amendment 2005/369/EC

Commission Decision 2005/369/EC of 3 May 2005 laying down rules for monitoring compliance of Member States and establishing data formats for the purposes of Directive 2002/96/EC of the European Parliament and of the Council on waste electrical and electronic equipment (notified under document number C(2005) 1355).

The amendment 2004/249/EC

Commission Decision 2004/249/EC of 11 March 2004 concerning a questionnaire for Member States reports on the implementation of Directive 2002/96/EC of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE).

RoHS CERTIFICATIIONS:

UL RoHS Product Certification:

The UL RoHS Product Certification is designed to help organizations self-declare compliance with the RoHS Directive:

UL tests representative samples of a product at the homogenous level for the six substances restricted by RoHS. If the substances levels are within the RoHS limits, manufacturers can apply UL RoHS Product Certification and Product Mark to their products. The qualified products must also meet UL's RoHS Product Certification requirements including on-site surveillance visits twice per year from a UL representative.

RoHS Calibration Standards:

RoHS Calibration Standards, coupled with a benchtop or laboratory-screening instrument, offer a complete solution for the requirements of RoHS legislation. Developed in co-operation with DSM Resolve, they provide the accurate calibration required for precise determination of product compliance using XRF spectrometry.

RoHS: Restriction of Hazardous Substances Compliance

RoHS CERTIFICATIIONS:

RoHS Calibration Standards:

Ideal for use with olefinic and other polymers, the RoHS Calibration Standards extend Panalytical's range of innovative industry solutions for meeting the challenges of environmental legislation such as RoHS, WEEE and ELV.

Multiple benefits:

The RoHS Calibration Standards guarantee the highest levels of accuracy and precision over a wide concentration range - from low ppm to low percentage. They offer unrivaled homogeneity and are the closest, in respect of composition, to official EU standards. Furthermore, carefully selected uncorrelated elemental concentrations allow accurate determination of line overlap correction factors.

Determination of all RoHS elements:

The standards consist of polyethylene discs containing the elements and compounds regulated by RoHS:

- Mercury (Hg), lead (Pb), cadmium (Cd)
- Bromine (Br) and chromium (Cr) - represent brominated flame-retardants and hexavalent chromium

Six additional elements commonly present in polyolefins as additives or fillers are also incorporated in the standards:

- Arsenic (As), chlorine (Cl), antimony (Sb), tin (Sn), zinc (Zn) and sulfur (S)

The RoHs Calibration Standards contain four different multi-element standards with different concentrations and four replicates. In addition four blank discs are provided.

RoHS: Restriction of Hazardous Substances Compliance

RoHS PROS:

Health benefits:

- RoHS helps reduce damage to people and the environment in third-generation countries where much of today's "high-tech trash" ends up.
- The use of lead-free solders and components has provided immediate health benefits to electronics industry workers in prototype and manufacturing operations. Contact with solder paste no longer represents the same health-hazard it did before.

Reliability concerns:

- Contrary to the predictions of widespread component failure and reduced reliability, RoHS's first anniversary (July 2007) passed with little fanfare.
- RoHS printed circuit board finishing technologies are surpassing traditional formulations in fabrication thermal shock, solder paste printability, contact resistance, and aluminum wire bonding performance and nearing their performance in other attributes.

Flow properties and assembly:

- One of the major differences between lead-containing and lead-free solder pastes is the "flow" of the solder in its liquid state. Lead-containing solder has higher surface tension, and tends to move slightly to attach itself to exposed metal surfaces that touch any part of the liquid solder. Lead-free solder conversely tends to stay in place where it is in its liquid state, and attaches itself to exposed metal surfaces only where the liquid solder touches it.
- For example, Motorola reports that their new RoHS wireless device assembly techniques are "...enabling a smaller, thinner, lighter unit." Their Motorola Q phone would not have been possible without the new solder. The lead-free solder allows for tighter pad spacing.

RoHS CONS:

- Lack of lab data increase risk.
- RoHS Directive does not delineate a number of key issues, including
  - Demonstration of compliance (labelling, testing, compliance certification, etc.)
  - Enforcement (civil and criminal)
  - Penalties (amount and nature)
- Expensive and complex.

The Best Quality PCB Supplier

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