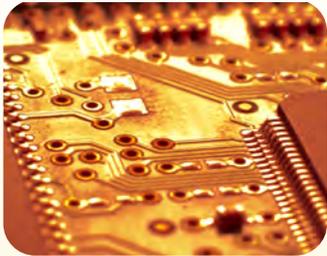




**UYEMURA  
USA**

## Line Card: Final Finishes



The **UIC ENIG Process** produces a highly uniform mid-phos EN deposit with a thin topcoat of immersion gold, over copper. It never requires “dummy plating.”

UIC ENIG provides high corrosion resistance, is solderable and aluminum wire bondable, and is compatible with all soldermasks. It runs at least 10°F below competitive products, and uses a low-concentration, ambient temperature, chloride-free catalyst.

Uyemura’s ENIG is widely preferred for special laminate materials and for preventing corrosion around the holes on FR-4 boards.



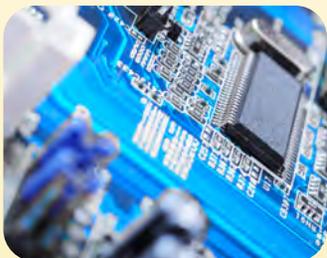
The **ENEPIG process** produces a highly uniform EN deposit, followed by electroless palladium, with an immersion gold flash. ENEPIG is the “universal finish,” suitable for soldering, gold wire bonding, aluminum wire bonding, and low contact electrical resistance. ENEPIG forms highly robust solder joints with lead-free SAC-type alloys. The ENEPIG process is an excellent solution for IC package PCB substrates, particularly ceramic-based products. ENEPIG is also immune to “black pad” nickel corrosion. Palladium is plated onto the EN via chemical reduction (rather than displacement) so there is no corrosion compromising the EN layer. ENEPIG is also useful in preventing BGA fractures.

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**UIC is the ENEPIG market leader.**

**We offer a truly unique variety of palladium processes for plating on nickel or copper or aluminum. We also have both phos alloyed-palladium (our Talon line) and un-alloyed palladium (our Altarea line).**

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**EPIG nickel-free PCB finish** is gold wire bondable, solderable, and ideal for HF use. It has opened up a wide, new design avenue for high frequency applications and designs with reduced spacing.

The EPIG process deposits palladium directly onto copper. Eliminating the nickel means there’s less build-up on circuits, and circuits can be controlled with smaller geometries. It’s a perfect fit for applications that demand smaller features and better clearances. EPIG offers unique and significant advantages for microwave applications, flex circuits, and end users requiring high purity levels.



**COPKIA ELPDDS** immersion palladium stripper removes palladium and gold from nickel.

COPKIA ELPDDS strips palladium at 60 u” (1.5 um) per minute at 70°-80° F with vigorous agitation. Although the rate of stripping can be increased by elevating the temperature, UIC recommends a 130° F maximum bath temperature.

The Palladium Stripper Additive (PSA) strips palladium residues from non-metallic tank and equipment. PSA is also used to clean gold residues from non-metallic immersion gold tanks and equipment. Separate baths are used for stripping gold and palladium to avoid cross contamination.

**MNK-4 Palladium Catalyst** is an electroless nickel plating activator for fine pattern PCBs. While traditional activators often have bridging issues when fine patterns are plated, MNK-4 eliminates the potential for bridging between pads. Its stable, chloride-free bath operates at 77-95°F; immersion time is 1-3 minutes.

**Nimuden NPR-4** is an acid electroless nickel plating bath for electronic and PCB applications involving fine line circuitry. The special bath formulation allows the deposition of electroless nickel without bridging. This process operates at lower temperatures, which allows for improved resist tolerance. The bath is very stable, easy to use and is optimized for automatic solution control using the UIC STARLINE-Ni controller.

**Nimuden NPR-8** is an important new, mildly acidic EN-phosphorus process for EN / gold plating to selective PWBs with dry film masking. The catalyst, electroless nickel, and immersion gold components have all been improved for greatest productivity.

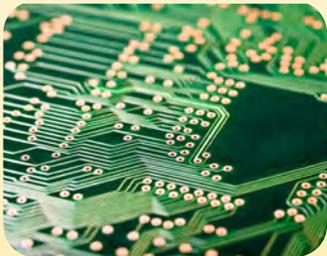
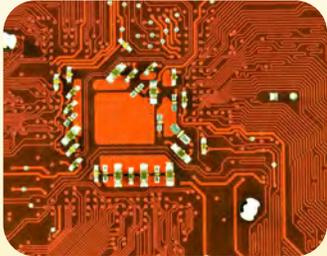
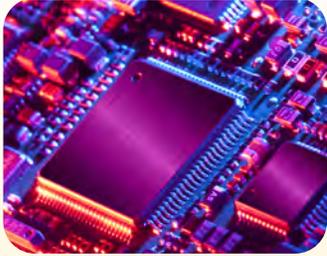
The NPR-8 bath is highly stable in continuous use, and the phosphorous content in the deposited film remains constant regardless of metal turn-overs.

**TAM-55 Immersion Gold** minimizes nickel corrosion, optimizing gold distribution. TAM-55 protects and maintains the solderability of the electroless nickel in an ENIG deposit. It is ideally suited for use as a solderable finish for small SMT and BGA pads. For maximum compatibility, use Nimuden NPR Series electroless nickel as the underlying deposit for PWB and IC packaging.



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## Line Card: Final Finishes



**Gobright TAW-66 Immersion Gold** provides superior performance, with low porosity and low nickel dissolution. It operates at 1 g/l gold metal, and offers high solder joint reliability, and minimal effect on the nickel layer.

**Gobright TLA-77 Immersion Gold** operates at just 0.4 g/l gold, minimizing inventory costs and drag-out losses. It was developed to provide “next generation” improvements in solder joint reliability.

**TWX-40 is an immersion gold bath** with autocatalytic capabilities, aka reduction-assisted immersion gold. It allows manufacturers plating ENIG to deposit 4-8  $\mu\text{m}$  of gold in a single step, without compromising the nickel/palladium substrate.

**Talon Electroless / Auto-catalytic Palladium** for ENIG is economical, solderable, and aluminum or gold wire-bondable. Deposition rate and quality of the deposit are highly consistent throughout the bath’s long life. Using Talon, palladium can be deposited directly on to copper, aluminum or electroless nickel.

**Alteara® TPD-21** is an autocatalytic electroless palladium bath for surface mount applications, including those with fine patterns. This unalloyed palladium bath has excellent wire bonding characteristics for PWBs and IC packages, as well as excellent solderability using lead-free solder. As-plated hardness is 280Hv.

The TPD-21 is exceptionally stable and easy to control. For optimum performance, use Nimuden® NPR series as the electroless nickel bath under-layer.

**DIG TCU-41 Direct Immersion Gold** for copper is a superior replacement for OSP finishes, and is exclusive to Uyemura. It is ideal for lead-free, high-temperature assembly.

**AuBel Electroless Gold** is a stable, alkaline pH, autocatalytic process. Properties include a gold deposit greater than 99.9% and a deposition rate of 80 micro-inches per hour. It has excellent gold wire bond properties. Gold and reducer can both be replenished.

**Presa RGA-14 Immersion Silver** meets industry demands for high density mounting, greater environmental safety and the prevention of copper oxidation under high-temp assembly conditions. It is a low-temperature, high productivity process, with silver directly displacing copper in an immersion reaction.

RGA-14 is an ideal soldering surface, and is aluminum wire bondable. It delivers high first pass yields, and prevents micro voids at assembly. The high purity of the bath allows superior touchpad functionality and low contact resistance.

**RGA Immersion Silver** deposits only on copper, and is ideal for high-density mounting. Bath is low temperature and highly stable; it will not attack solder masks.

**The Presa RMK-25 immersion tin bath** produces a highly uniform surface finish (thickness control is 1.5 standard deviation from the mean) that is ideal for backplane and other press fit applications. The flat microstructure has excellent aesthetics, and minimal copper etchback. Solderability is excellent, even with high temperature solders and when subjected to lengthy storage. The finish is compatible with both eutectic and lead-free solder.

Tin is deposited only on the copper surface, via displacement; process cycles are up to 3X faster than the competitive average. Deposits are highly consistent throughout the life of the bath. The RMK-25 solution has a relatively low operating temperature, is fluoride-free, and can be used with vertical or horizontal equipment.

**MPC-200** Through-hole alkaline soak cleans copper substrates prior to plating for ENIG or ENIG. It removes residual palladium from electroless copper processing in the NPTH, and is particularly useful for ENIG pretreatment where residual PD would allow nickel to deposit in the NPTH. It is an excellent surface prep for micro-etching. MPC-200 will not compromise resist, and rinses well with water.



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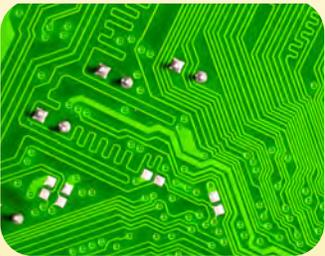
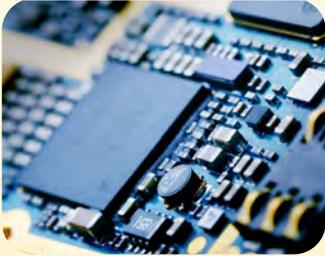
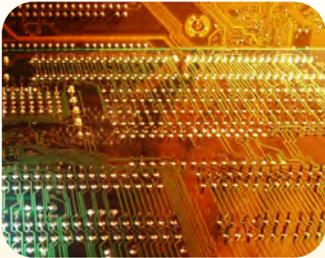
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**UYEMURA  
USA**

# Line Card: Acid Copper Plating



## Through-hole plating

**Thru-CUP ECD-CF** is a high-speed copper plating process for use with insoluble anodes. It operates at up to 40 ASF current density and provides excellent performance for BVH immediately following make-up. Throwing power remains high despite bath aging; ECD-CF is easily controlled with CVS measurement.

**Thru-Cup ECD-H** is a high-speed acid copper plating process for use with soluble copper anodes. It operates at 20 to 50 ASF current density and provides throwing power greater than Thru-Cup AC-90 while minimizing sludge.

**Thru-Cup EPL** “high throwing power” acid copper additive is designed for high aspect ratios with fine lines circuitry. It offers the simplicity of DC plating with results that compete favorably with complex waveforms of pulse plating.

**The EPL Very High Aspect Ratio (25:1)** plating process delivers greater than 60% throw, with zero dog-boning at the hole entrance.

**Thru-Cup ETN** is an acid copper additive for printed wiring board plating. It is ideally suited for vertical conveyORIZED lines where plating speed is critical. It plates with current densities as high as 40 ASF or 4.0 ASD. The chemistry is very stable and does not require continuous regeneration.

## Via Filling

**Thru-Cup EVF-R** is an acid copper system that fills blind vias 30 microns to 145 microns with deposited copper, often in less than 90 minutes. Unique organic additive system is based on DC rectification – no pulse plating is required.

The process produces minimum (<15%) “dimple” and low surface thickness. Stable organic additives never require regeneration. Carbon treatment is recommended at 2000AH/L of bath every 10–12 months. Deposits have excellent elongation and tensile strength. EVF-R is compatible with both panel and pattern (button) plating.

**Thru-Cup EVF-N** plates through-holes and vias simultaneously, reducing process times by 50%. It delivers exceptional performance for hole diameters smaller than 150 micrometers. Designed for soluble anodes, it is suitable for both pattern and through-hole plating. The process uses DC current, which lowers equipment cost and chemical consumption.

**MSC-PS** is an excellent cleaner for all acid copper applications, particularly blind via cleaning. This low surface tension cleaner has excellent wetting capabilities. It does not contain organic solvents, and will not attack the photoresist.

## Copper Etching

**MEC EtchBond CZ-2030** is an organic acid-type copper surface roughening process, providing performance equal to CT-910 with fewer components. Its unique surface topography provides the best adhesion on resin systems.

CZ-2030 has a stable etching rate, and provides maximum soldermask adhesion at a low etch (less than 40  $\mu$  inch). CZ-2030's single-component system, coupled with its high copper capacity (55 g/l) minimizes inventory and waste.

**MEC EtchBond 5480** is a nitric acid-based formulation for copper micro roughening for PWB dry film and soldermask applications. It provides a unique copper surface topography that is unachievable with conventional chemical cleaning, enhancing adhesion between copper surface and resin.

