

CLEARSignals

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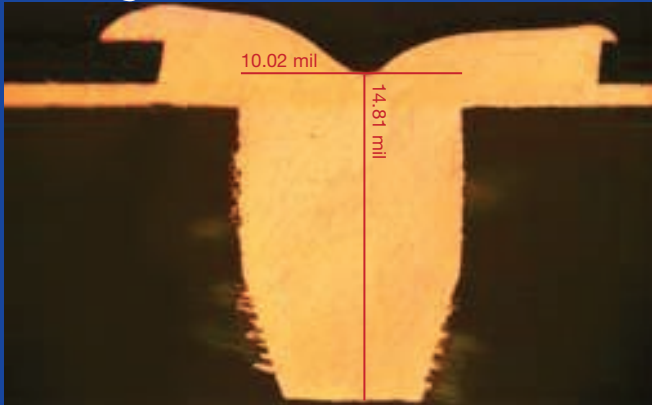
UYEMURA INTERNATIONAL CORPORATION



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EVF-R Earns Kudos for Deep Via Fill

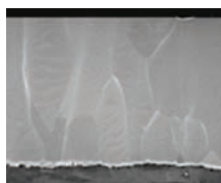
Plating occurs in most blind vias at 20 ASF in less than 90 minutes



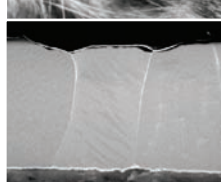
The micrograph shows a high aspect ratio blind via (1.4 : 1.0), plated using EVF-R. Courtesy TTM Technologies, Santa Ana, CA. TTM Technologies is a leading independent supplier of time-critical, technologically advanced printed circuit boards and backplane assemblies to original equipment manufacturers and electronic manufacturing services companies.

North America's number one choice for via fill, DC plating is now Thru Cup EVF-R. This unique organic additive system fills blind vias, including those where depth is substantially greater than width, with electroplated copper using vertical plating equipment. The process has higher than average productivity for this level of sophistication in plating. EVF-R works well with panel and pattern plating (*button plating*). The 3-component system has a wide operating window; bath performance is consistent, regardless of age.

Uyemura Announces "22,000-Hour Solution" to Tin Whiskers Formation



GRX-70
fine grained equiaxed



Conventional large
grained columnar



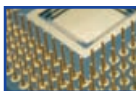
Uyemura International Corp., world leader in high-performing plating processes, has announced a technology proven to prevent whisker formation in electroplated tin for 22,000 hours – and longer.

This unique high-speed electrolytic process, trade-named GRX-70, is a breakthrough in the control of tin whiskers. Whisker crystals of tin and tin-based alloys are the most common culprits in the short circuiting of electronic components.

Most often, the cause of tin whisker formation is compressive stress.

The proprietary technology developed by Uyemura dissipates compressive stress, preventing whisker formation.


Continued on page 4



“Precious Metals – Still on the Rise”

By Don Walsh, Director of Operations



 Our last few editorials forecasted a continuing rise in precious metals, which has, indeed, occurred. Can they keep rising? And if so, how can buyers manage what seems to be an endless climb?

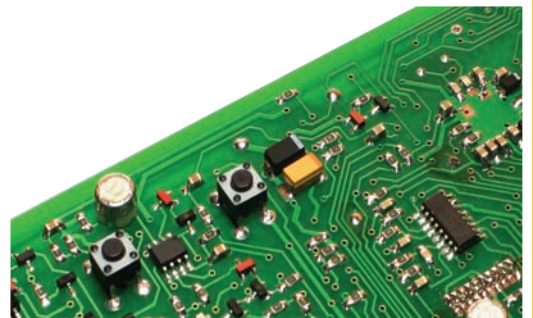
Wall Street Journal on 11/18/10. Savvy manufacturers are using much more silver, as well as platinum. (Silver is cheaper, but platinum is more expensive than gold, so it is chosen for style reasons, as opposed to cost savings.) Also, many wedding bands are now made with cobalt and tungsten. This industry still uses 52% of world-wide gold purchases, but that is down from 73% in 2005.

As to the current wisdom regarding where gold, silver, and the other precious metals are headed, there is more confusion than clarity. As always, anyone who could make predictions with certainty would be making millions instead of writing about it.

An astute article in the November 10, 2010 *New York Times* pointed out that all the reporting on record-high gold prices is far from accurate if adjusted for inflation. The former record, set in 1980, would equate to \$2387 per ounce today – so the metal will have to move 68% higher if it is to set a true “record.”

In late 2010, Ryan Chittum from the *Columbia Journalism Review* suggested that the epidemic of gold records is largely perpetrated by journalists who are less than fully informed about economics – or history. An easy, “hot” story is, for many of them, far sexier than the truth. He urged the news media to stop misleading its readers.

In recent weeks, gold pushed through \$1400 and silver topped \$33, although both have retreated – for now. Where they will be by the time you read this, no one knows. As always, buy smart and use wisely.



For our general metal finishing customers, an effective strategy has been a switch from silver to Miralloy. The latter does not tarnish and costs 80% less than silver plating. Not bad.

Equally substantial savings can be realized by our ENIG customers in the electronics industries.

At these \$1300+ price ranges for gold, 80% of the cost of running ENIG is due to the amount of gold on the boards. And Uyemura baths can reduce that gold by half. We have developed several baths with a proven track record in this regard, and they have been operational now for several years. As a result, several Uyemura customers are enjoying a 50% savings on their ENIG running costs.

Surprisingly, the one sector that has cut back substantially on gold use is the industry that uses it the most, jewelry manufacturing. Since 2005, use has plummeted more than 35%, according to an article in the

“UYEMURA
BATHS
CAN
REDUCE
GOLD
CONTENT
BY HALF”

MORE ON ACID COPPER

Superior plating results for challenging parts with high aspect ratio holes and uneven circuit density distribution have made Thru Cup EPL the leading product in its class. The system is easy to manage and uses DC current (5-25 ASF). Equally important, it performs without the need for pulse rectification. This makes plating chemistry easier to control, and eliminates a costly and often problematical piece of equipment.

For faster plating, an excellent DC bath alternative is Thru Cup ETN (20-40 ASF). ETN is an acid copper additive specifically for printed wiring boards. It is ideally suited for vertical conveyORIZED lines, where process speed is crucial. ETN was engineered for current densities as high as 40 ASF or 4.0 ASD. It combines the simplicity of DC plating, with results that rival more complex waveforms of pulse plating.

The chemistry of ETN is highly stable and does not need continuous regeneration.

The Thru Cup ETN process produces a fine-grained equiaxed copper deposit. Its leveling capability overcomes irregularities on the substrate surface and prevents nodule growth. The deposit is bright and ductile, with excellent elongation, tensile strength and metallurgical properties.

Thru Cup ETN is a two-component system: the carrier controls deposit uniformity, and the brightener is the grain-refining additive. Solution components and additives have a wide operating window.

Watch for new developments regarding a system that will fill the via and simultaneously plate the through-hole, using insoluble anodes.

ENIG/ENEPIG UPDATE

ENIG is fast becoming the first choice for LF soldering, despite the meteoric rise in gold prices. A new generation of ENIG is already in place to mitigate nickel corrosion. This new generation technology has been successfully implemented at prominent manufacturing sites worldwide.

Interest in ENEPIG continues at a record pace, thanks to its excellent performance as an LF soldering surface, gold and aluminum wire bondable surface, and contacting surface. Uyemura ENEPIG protects the electroless nickel interface using a thin electroless palladium layer, prior to immersion gold, preventing gold attack on the EN surface. Plus, Uyemura ENEPIG is black-nickel free.

IPC is currently writing a much-needed specification for the industry.

(See story, page 4)



... More than Immersion Tin ... More than Immersion Silver



Uyemura ENEPIG

Provides a Final Finish that is
Close to **"Indestructible"**



GRX-70 uses a high purity anode, and is ideally suited for connectors and semiconductor lead frames. It offers high deposition speeds for rackless and reel-to-reel processing, and high deposition efficiency over a wide current density range. The bath is lead and fluoride free, and foam-resistant. Operating range is 113-131°F, with 122° the optimum.

The GRX-70 film has a uniform white matt appearance; appearance after reflow is excellent. Carbon and sulfur concentrations in the film are very low, and control over liquid level is easy. The film is heat-resistant, with excellent solderability.

For detailed product data or test information, contact your Uyemura representative.

John Nowakowski is New Technical Salesperson for the Southeast and Mid-Atlantic States



John is an experienced "generalist" with several valuable specialties. He has extensive experience with connector plating and general metal finishing, and has worked for two continuous plating businesses, also for a full-line distributor and two proprietary plating process manufacturers.

His strong background in the connector and general metal finishing arenas, combined with UIC's fast-growing product acceptance, will provide many additional customers the benefit of state-of-the-art, yield-improving processes.

ACL-634 is a New ENIG Through-hole Cleaner

This acid-type soaking cleaner is well suited for the pretreatment in electroless Ni/Au processes with NPT (Non-Plating Through-hole). ACL-634 removes palladium from NPTH, will not damage permanent resist, and rinses well with water.

IPC Plating Committee 4-14 ENEPIG Specification Update

Objective: To determine the thickness of Pd in ENEPIG for soldering and wire bonding applications. The following suppliers provided the required finish for the Round Robin Testing: Atotech, Dow, Uyemura, Cookson, OMG and MacDermid

Solderability and Solder Joint Reliability Testing

"Wetting Balance" and "Spread Tests" were performed following temperature and humidity stressing. Solder joint reliability was tested by ball shear. All testing was run with tin/lead and SAC305 LF solder.

The W coupon (IPC-6012) was used. The thickness of the ENEPIG tested was as follows:

- EN: 5 μm +/- 1
- EP: 0.1, 0.2, 0.3, and 0.5* μm (* only from one supplier).
- IG: as much as supplier immersion gold process will allow.

Status: Wetting Balance and Solder Spread testing is now complete, and results are being tabulated.

Wire Bonding:

The Wire Bonding Coupon supplied by K&S: There are 2 levels of surface roughness. One was particularly coarse (RA~100), using mechanical scrubbing. The thickness to be tested was as described above.

All combinations were tested as follows:

- Gold wire bonding ball/wedge
- Samples will be bonded as received and after stress (4 hours at 150°C)

Status: Coupons are at the testing sites, with results expected by the end of March, 2011.

This IPC Committee is co-chaired by George Milad and Gerard Obrien.

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