

# Gobright® TWX-42 RAIG®

## Gobright® TWX-42 RAIG® (Reduction-Assisted Immersion Gold)

is an environmentally favored process for ENIG, ENEPIG, and EPIG. It is a 5th generation “mixed reaction” gold: displacement initially occurs on the nickel surface; the autocatalytic reaction that follows prevents nickel corrosion.

- Uyemura RAIG is a proven alternative to earlier attempts to achieve heavier gold deposits on ENEPIG, i.e. extending dwell time in the bath. That practice forces the immersion bath to do what it was never designed to do, causing inevitable damage to the nickel underlayer.
- **TWX-42 is a low concentration** (0.5 g/L) process engineered for deposition on Nimuden NPR-8 and NPR-4 Electroless Nickel (ENIG) and Electroless Palladium (ENEPIG and EPIG) for PWB and IC packaging.
- The RAIG bath produces significantly thicker gold deposits than standard immersion golds; deposits are non-porous and highly uniform. ESCA depth profiling detects no foreign elements in the gold film and no oxygen at the Au/Pd interface. Uniformity is independent of PWB surface geometry.
- **TWX-42 is an exceptionally stable bath** with fewer additives, and a lower cost, than conventional gold baths. Its non-toxic additive package prevents plate-out with just daily additions.
- **TWX-42 has exceptional solderability** and wire bonding capability. It produces no statistical differences in gold distribution across various pad sizes. TWX-42 is compatible with existing plating lines and is readily controlled by standard analytical methods.

*TWX-42 is IPC 4552/4556 compliant.*

It has been granted US patent 7985285(TWX), 7988773(TSB).



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# Experts comment on **TWX-42**

“ **The standard deposit** for ENEPIG has historically been 1-2  $\mu\text{in}$  of gold. Many customers now consider this insufficient, and designers are routinely seeing specifications for a minimum 3-5  $\mu\text{ins}$  gold. A thicker gold deposit on ENEPIG is seen as a way to enhance wire bonding to the finish, while preventing damage to the nickel underlayer. ”

“ **Heavier gold is** most often specified where there is atmospheric corrosion. In harsh environments – both extreme temperature and also ‘light pollutant’ environments - thicker gold is more robust, maintaining high solderability and low contact resistance. ”

“ **One advantage** is you can integrate this chemistry into an existing line without adding tanks. The alternative, thin immersion followed by electroless gold, requires two tanks. With TWX-42, the single-step immersion gold process takes over. This is a big advantage, because for any shop, a gold bath is a major investment. ”

“ **Minimizing nickel corrosion** is so critical. When depositing standard immersion gold on palladium, the reaction is difficult and a mixed reaction bath like TWX-42 is capable of initiating quickly on both a palladium deposit and a nickel deposit. Immersion gold reactions on palladium are slow, and you need a chemistry like TWX if you’re going to deposit thicker gold on palladium. ”

“ **We have tested resistance** to etchants, specifically looking at time exposed to ferric chloride. TWX-42 shows no etchant penetration after 30 minutes exposure, most likely the result of a finer grain structure, or thicker, non-porous gold - or both. ”

