

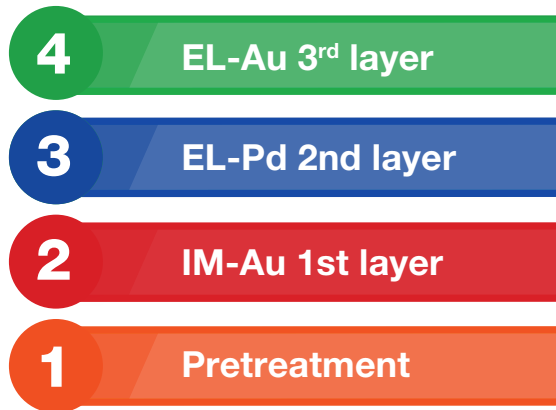


The IGEPIG Process: A Performance Overview

Uyemura has conducted extensive R&D on the IGEPIG process, focusing on wire bonding reliability (WBR), solder joint reliability (SJR), fine pattern ability and low insertion signal loss. Each characteristic has been evaluated to determine the optimum thickness for each IGEPIG layer.

IGEPIG is a palladium activator-free process.

The process involves 4 key steps: pretreatment, IM-Au layer, EL-Pd layer and EL-Au layer.



Detailed findings can be made available; below are 7 key performance metrics:

- ▶ IGEPIG's unique chemistry prevents palladium over-plating.
- ▶ IGEPIG has high WBR (according to wire pull and bump shear tests) and SJR (according to ball pull and high speed shear tests).
- ▶ The WBR of IGEPIG improves after high temperature stress.
- ▶ AES wide scan analysis shows that neither Cu nor Pd diffuse to the surface of IGEPIG.
- ▶ IGEPIG's fine pattern ability is superior to standard or thin nickel ENEPIG, ENIG and EPIG.
- ▶ IGEPIG has excellent SJR for multi-reflow at 240° C: SJR comparable with ENEPIG.
- ▶ IGEPIG signal loss is lower than ENIG because there is no electroless nickel layer in the IGEPIG deposit.

