

Product Description

An exceptional, eco-friendly immersion gold replenishment solution formulated to replenish LILO-ImmAu solution for a thin, even, and robust gold finish.

Features

- Cyanide free
- Free of strong chelates (e.g. EDTA)
- No decrease in plating performance even after 5+ metal turnovers

Reminder: Make sure to have both *LILO-ImmAu™* and *LILO-Au Replenish™* at your plating facility.

Health & Safety

Before using this product always refer to the Safety Data Sheet (SDS) provided with *LILO-ImmAu Replenish™* for details on recommended handling precautions, and product storage.

FIRST AID - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

IN CASE OF SPILL - Large spill: Stop leak if without risk. Move containers from spill area. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). The spilled material may be neutralized with sodium carbonate, sodium bicarbonate. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product.

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Product Information	
Typical Application:	Printed Circuit Board (PCB) plating, Semiconductor industry applications, etc.
Lower gold consumption & improved solder joints performance (achieved in combination with Ni-less ENIG-Premium™ products)	
Data	
International Compliance	IPC 4552 (ENIG standard)
Appearance	Slightly transparent, dark orange liquid.
Deposition Thickness	6-8min in LILO-ImmAu™ yields a 2µin. ±10% (50nm ± 10%) gold surface (<i>compliant to IPC 4552</i>)
Temperature Range	80-90°C / 176-194°F (Recommended: 85°C/185°F)
pH	2-3 pH at 25°C
Specific Gravity	0.4-0.6
Bath Life	5+ MTOs
Filtration Porosity	5-10µm

Operation Notes

- Use in concentration supplied.
- Filtration during plating (LILO-ImmAu solution) is recommended (may affect surface thickness due to agitation)
- Filtration and agitation are recommended throughout the plating process (LILO-ImmAu solution) to maintain solution performance and plating appearance.
- Exposure to foreign/external **metal devices** should be kept to a minimum or avoided completely (e.g. metal thermometers, metal clamps, mixers, digital controllers, etc.).
- If a metal device is exposed or immersed in the solution rinse with deionized (DI) water and dry with inert material immediately.

Operation Parameters

- Gold compound concentration in the LILo-ImmAu solution should be no less than **0.75g/L** (equivalent Gold metal concentration 0.36 g/L) to ensure plating performance (**Gold compound concentration = 2.09 X Gold concentration in solution using XRF or AAS**).
- Recommended gold compound concentration in the LILo-ImmAu solution is **0.8-1.2g/L**

Bath Maintenance

- Proper filtration throughout the LILo-ImmAu plating sessions (5µm mesh size/porosity recommended)
- Gold compound concentration is maintained above **0.75g/L (Gold metal conc. 0.36g/L)** in LILo-ImmAu solution

- Water level is maintained throughout LILO-ImmAu plating process

Bath Analysis

- LILO-ImmAu Bath analysis is a key step in proper bath maintenance
- The most common methods to check gold concentrations of LILO-ImmAu solution are X-Ray Fluorescence (XRF) or Atomic Absorption Spectroscopy (AAS)
- X-Ray Fluorescence (XRF):** A non-destructive analysis technique where the sample is exposed with X-rays from a source and information on the elemental composition is measured by the fluorescent (or secondary) X-rays emitted from the sample
- Atomic Absorption Spectroscopy (AAS):** A destructive analysis technique where the sample is atomized into a gaseous state and the quantity of chemical elements is determined by the absorption of optical radiation (light)
- Use data from a calibrated XRF or AAS to find concentrations of metal constituents and replenish accordingly

Bath Replenishment

- Check gold (gold content ~48% in the gold compound) concentrations in LILO-ImmAu solution with XRF or AAS, then replenish accordingly.
- Check water level regularly or use a water-level controller.
- See **Addendum 1** for full details on *LILO-ImmAu™* replenishment.

Storage

Store in accordance with local regulations. Keep only in the original container in a cool well-ventilated place. Keep container closed when not in use. Keep away from incompatible materials. Keep away from sources of heat. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

Disposal

**NEVER POUR SOLUTION INTO PUBLIC WASTEWATER SYSTEMS
(e.g. Sinks, drains, toilets, etc.)**

Product:

Dispose of this material and its container to hazardous or special waste collection point. Send to a licensed recycler, reclaimer or incinerator. Dispose of this material and its container to hazardous or special waste collection point. Dispose at suitable refuse site.

Contaminated packaging:

Dispose of as unused product.

Disposal should be in accordance with local, state or national legislation.

Disclaimer

Review the TERMS AND CONDITIONS GOVERNING SALES document for LiloTree regarding all product and warranty information.

We provide support for our **Ni-ENIG-Premium™** products within our terms and conditions from our Redmond office.

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Addendum 1: LILo-ImmAu™ Replenishment

Equipment

- 5ml or 10ml pipette
- 100ml plastic beaker/container (XRF) or volumetric flask (AAS)

Reagents

- LILo-ImmAu Replenish™

Procedure

- 1) Calibrate AAS or XRF using recommended standards.
- 2) Review the parameters of your AAS or XRF to determine the appropriate volume of a bath sample to use.
- 3) Using the pipette measure out the appropriate volume of LILo-ImmAu and dispense into a 100ml beaker/volumetric flask.
- 4) Following the appropriate operating procedure for either AAS or XRF measure the gold content of the sample.
- 5) Record the AAS or XRF results (this can help users predict and estimate their usage).
- 6) Assess the current gold compound concentration of LILo-ImmAu from the AAS or XRF results (gold content ~48% in the gold compound) and calculate the required replenishment needed to bring the solution to ~1g/L (3.8g/gal.) gold compound concentration (gold compound concentration = 2.09 X gold metal concentration in g/L measured by AAS or XRF)

Calculation Data

- Find the amount of replenishment solution needed using the equation:

$$(1 - (2.09 \times \text{Concentration of Au in g/L})) \times 10 \times \text{Volume of tank (liters)} = \text{mL of LILo - ImmAu Replenish Needed}$$

Replenishment

- 1) Measure the appropriate amount of LILo-Au Replenish™ calculated in the previous steps and dispense into the 500ml glass beaker in order to heat the required LILo-Au Replenish content to **80°C /176°F**.
- 2) Make sure the LILo-ImmAu™ bath is heated to at least **80°C /176°F**. **Also**, heat the LILo-Au Replenish™ solution to **80°C /176°F**. This is an important step in the replenishment process. Failure to do so may cause non-uniform dissolution of the replenishment solution into LILo-ImmAu™ which may require extended agitation to fix.
- 3) Once the replenishment solution is properly heated, carefully pour the measured LILo-Au Replenish solution into the tank containing LILo-ImmAu™.
- 4) Agitate the solution once all the replenishment has been added to ensure uniform dissolution.

Examples/Quick Reference

Gold Concentration using AAS or XRF	Total Volume	LILo-Au Replenish required
0.4 g/L	95 liters	155 mL
0.375 g/L	190 liters	408.7 mL
0.45 g/L	379 liters	224.9 mL