

Process flow chart

| Responsible person | Process flow | Table and record used |
|--------------------------|--|---|
| Electroless Gold Section | <pre> graph TD A[Material loading] --> B[Exchange] B --> C[Degrease] C --> D[Hot water clean] D --> E[Water clean] E --> F[Water cleaning] F --> G[Micro etch] G --> H[Water cleaning] H --> I[Water cleaning] I --> J[Acid cleaning] J --> K[Pure water cleaning] K --> L[Pre-immersion] L --> M[Activation] M --> N[Post immersion] N --> O[Empty tank] O --> P[Pure water cleaning] P --> Q[Hot water clean] Q --> R[Degrease] R --> S[Exchange] S --> A J --> T[Pure water cleaning] T --> U[Host pure water clean & degrease] U --> V[Electroless gold] V --> W[Recycling] W --> X[Pure water cleaning] X --> Y[Hot pure water cleaning] Y --> Z[Unloading] K --> AA[Electroless Nickel] AA --> AP[Pure water cleaning] AP --> AT[Pure water cleaning] AT --> AU[Host pure water clean & degrease] J --> AK[Pure water cleaning] AK --> AL[Pre-immersion] AL --> AM[Activation] AM --> AN[Post immersion] AN --> AO[Empty tank] AO --> AP </pre> | Checklist First grade maintenance table 8-1 First article inspection table for electroless gold. 8-2 PH test table for electroless gold line and Ni, Au chemical tank. 8-3 Chemical tank change record for electroless gold line. 8-4 Water cleaning tank change record for electroless gold line. |

6-3 Operation conditions

| Name | Chemical solution name | Concentration range | Temperature | Analysis frequency | Frequency of tank change |
|--------------------------------------|--|---------------------|-------------|---|---|
| Acid cleaning tank | H ₂ SO ₄ | - | 40 (35-45) | Daily | 14 days |
| Micro etch tank | SPS | - | 28 (25-40) | Daily | Cu > 12 g/L |
| | H ₂ SO ₄ | - | | | |
| | Cu content | - | | | |
| Acid cleaning tank | H ₂ SO ₄ | - | RT | Daily | 2 days |
| Pre-immersion tank | H ₂ SO ₄ | - | RT | Daily | 3 days |
| Activated tank | Pd | - | 23 (20-27) | Each shift | Cu > 100 ppm or one month |
| | H ₂ SO ₄ | - | | | |
| Post Immersion Tank | H ₂ SO ₄ | - | RT | Daily | 2 days |
| Electroless Nickel Tank | Ni | - | 83 (80-90) | Each shift | 6MTO or Anti-precipitation current > 0.8Amp |
| | NaH ₂ PO ₂ | - | | Daily | |
| | pH | - | | Each shift | |
| | NaH ₂ PO ₃ | - | | Daily | |
| Immersion Gold Tank | Au | - | 86 (80-90) | Each shift | 8MTO or Ni > 800ppm or Cu > 5ppm |
| | Cu content | - | | Daily | |
| | Ni content | - | | Daily | |
| | PH | - | | Each shift | |
| Inspect on gold and nickel thickness | First Article Inspection can be performed in different frequencies, for example: each lot, each shift, each new material number; inspection in the production is about very two hours. | | | Take two boards, each side has five points and the total is 20 points, then use X-RAY to measure gold and nickel thickness. | |