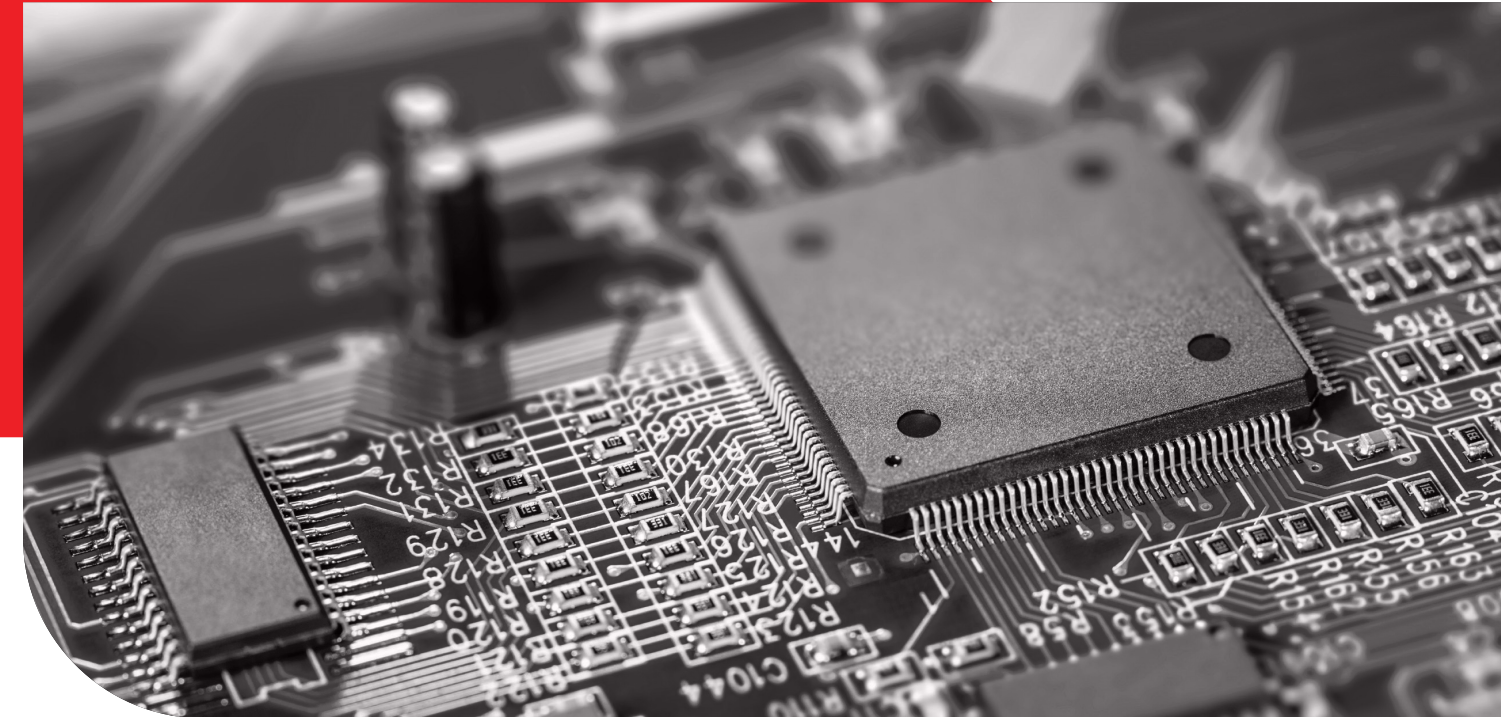


PROVEN PLATING PROCESSES FOR PRINTED CIRCUIT BOARDS

PROCESS	PRODUCT	DESCRIPTION
HAL pre-treatment	Solderex 641	Innovative flux formulation for treating PCBs with hot air levelled tin-lead coating. Water-soluble & biodegradable. Ensures uniform coating in hot air levelling, offering excellent solder wetting to copper. Easy application via spray or roller process
ML bonding enhancer	Gibonol C	Oxidizer for copper foils in multilayer laminates. Enhances bond strength between copper foil and dielectric substrates

PROCESS	PRODUCT	DESCRIPTION
IMMERSION TIN		
Cleaner	Gintron AD 482	Acidic liquid cleaner for cleaning, conditioning, and activation of copper surfaces. Maintains compatibility with most resist materials
Microetch	Gintron AD 481	Cleans and uniformly etches copper surfaces without affecting the dielectric. Offers controlled etching action and ensures a prolonged solution life
Predip	Gintron Predip	Controlled acidity makes it suitable for use in through-hole plating of multilayer boards
Tin bath	Gintek SN	Cyanide-free immersion tin-plating process designed for SMT PCBs (HASL-free). Deposits 0.65-1.3 µm in 10-20 minutes. Produces lead-free, dense, and corrosion-resistant tin deposits with enhanced solderability
WIDE RANGE OF CHEMISTRIES FOR PCB MANUFACTURING		
Oxide replacement	Gintron MB 438	Unique black copper oxide that enhances inner layer bond strength in MLB fabrication. Resists thermal degradation during reflow, hot air levelling, or wave soldering and improves solder mask adhesion in SMOBC processes
Cyanide-free Immersion Silver	Growel Silva IM Process	Nitrate and cyanide-free immersion silver plating process with a deposition rate of 0.4-0.6 µm/20 minutes. Sustains electrical conductivity and solderability even when exposed to heat, pollution, and humidity
Organic Solderability Preservative	Gintron Plus	OSP for SMT PCBs; cost-effective alternative to immersion Tin, ENIG, and ENEPIG
Smear removal	Gictane 70	Replaces hydrofluoric acid in etch-back applications. Aids in dissolving or etching fibreglass fibres efficiently



About Growel

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TRUST THE LEADER IN SURFACE FINISHING

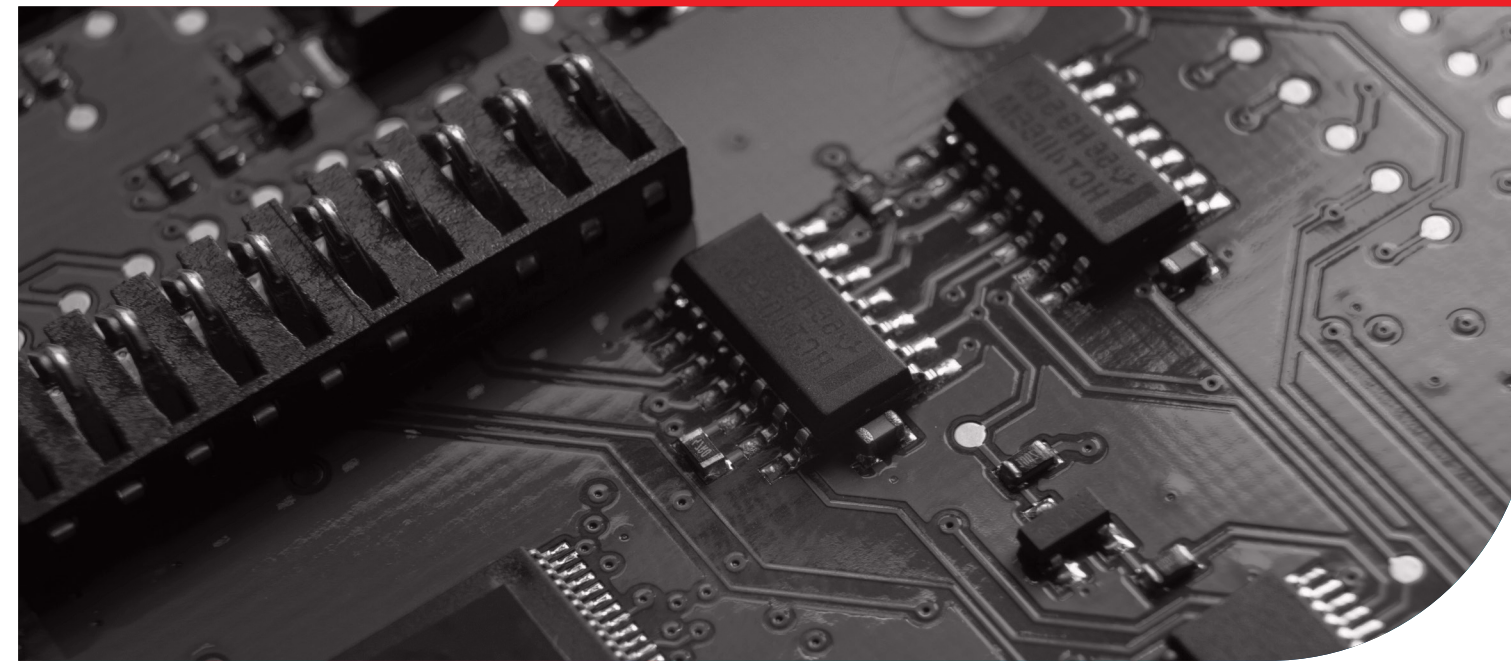
PROCESS	PRODUCT	DESCRIPTION
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DESMEAR

Sweller	Gintron MLB 495	Prepares the dielectric for a clean, micro-roughened, and micro-porous through-hole topography in multilayer PCBs. Essential for achieving optimal three-pin connections
Permanganate Etch	Gintron MLB 497	Facilitates a controlled attack on the organic substrate. Selectively removes presensitized dielectric materials from the inner layer and hole wall surfaces, establishing 3-point connection sites for inner layers. Creates a micro-porous resin topography for subsequent copper plating
Reduction	Gintron MLB 498	Efficiently transforms all manganese compound residues on the board surface & hole walls into a soluble state, leaving the surface clean. Simultaneously removes unwanted copper oxides from copper surfaces, promoting optimal copper-to-copper bonding

PLATED THROUGH-HOLE (ELECTROLESS COPPER)

Cleaning/Conditioning	Gintron CC 5725	Removes oil, soils, fingerprints, and drilling debris. Prepares the PCB surface before black oxide, solder mask, and other pre-treatment processes. Enhances adhesion of electroless copper on hole and promotes coverage without voids across the hole wall
	Gintron CC 50	Mild alkaline liquid cleaner for soak cleaning of PCBs. Eliminates tarnish, soils, fingerprints, and drilling debris. Excellent static charge modifier. Conditions the hole wall & facilitates a uniform, fine-grained electroless copper deposit
Microetch	Gintron AD 481	Cleans and uniformly etches copper surfaces without affecting the dielectric. Offers controlled etching action and ensures a prolonged solution life
Pre-activation	Gintron PC 236	Controlled acidity makes it suitable for use in through-hole plating of multilayer boards
	Gintron Additive 443	Single-step tin-palladium solution for exceptional electroless copper coverage and adhesion within holes and on the copper surface of drilled board
Activation	Gintron Activator 444	Highly concentrated single-step tin-palladium colloidal solution for outstanding electroless copper coverage and improved adhesion within holes and on the copper surface of PCBs
Reduction	Gintron PA 491/493	Improves initial deposition rate of electroless copper thus ensuring uniform and strong electroless copper bonding to the laminate
Electroless Copper	Gintron Cu 406	Stable room temperature electroless copper bath for low build PCB processing. Produces bright, dense, fine-grained rose-pink deposits
	Gintron Cu 703	Innovative, stable, high-speed electroless copper plating (deposits 2.0 - 3.0 microns in 30 min). Yields bright pink, ductile deposits, aiding in convenient through-hole coverage inspection
Anti-tarnish	Gintek Cu 56	Protects copper circuits from tarnish and corrosion during storage. Boosts solderability at room temperature. Easily removable with alkaline solutions



PROCESS	PRODUCT	DESCRIPTION
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PATTERN PLATING (ACID COPPER & TIN)

Acid Cleaner	Gintron AD 482	Acidic liquid cleaner for cleaning, conditioning, and activation of copper surfaces. Maintains compatibility with most resist materials
	Gintron PC 455	Acidic cleaner that effectively removes aqueous binder residues from dry film photoresist on copper tracks before PCB pattern plating. Does not compromise integrity of the photoresist
	Gintron PC 458	Liquid acid cleaner that boosts the receptivity of electroless copper-plated surfaces. Streamlines the direct application of plating resist, ensuring superior adhesion without the need for pre-scrubbing or etching
Microetch	Gintron AD 481	Cleans and uniformly etches copper surfaces without affecting the dielectric. Offers controlled etching action and ensures a prolonged solution life
Acid Copper	Gintron Cu 944	Single additive acid copper plating system for PCB fabrication; especially those with high density circuits and high aspect ratios. Produces highly ductile & uniform deposits with a thickness ratio of 1:1 on surface to hole wall
	Gintron Cu 945 High Throw	High throw ductile bright acid copper process specially designed for through-hole plating. Single additive; making it stable, easy to operate, and economical. Can be operated at over 40°C to increase bath speed
	Cuprobrite HT	High throw ductile, stable, easy to operate and economical, bright acid copper plating process for through-hole plating. Employs single additive
Acid Tin	Stannolume (Brightner + Carrier Additive)	Sulphate-based bright tin process that employs a unique combination of carrier additive and brightener to produce mirror bright, silvery white deposits with excellent solderability and ductility

PROCESS	PRODUCT	DESCRIPTION
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ELECTROLESS NICKEL IMMERSION GOLD (ENIG) & ELECTROLESS NICKEL ELECTROLESS PALLADIUM IMMERSION GOLD (ENEPIG)

Acid Cleaner	Gintron AD 482 ENIG ENEPIG	Acidic liquid cleaner for cleaning, conditioning, and activation of copper surfaces. Maintains compatibility with most resist materials
Microetch	Gintron AD 481 ENIG ENEPIG	Cleans and uniformly etches copper surfaces without affecting the dielectric. Offers controlled etching action and ensures a prolonged solution life
Activator	Gintron Activator 446 ENIG ENEPIG	Used for catalysing copper surfaces, especially for electroless nickel on copper surfaces during the manufacture of SMT PCBs and in EMI / RFI shielding operation
Electroless Nickel	Gintron Ni SEP 9304 ENIG ENEPIG	Deposits semi-bright nickel phosphorus (P: 4-7%) uniformly. Ensures good bonding and solderability. Ideal for PCB plating (deposit thickness of 4-6 µm)
Electroless Palladium	Gintron PD 106 ENEPIG	Applies cost-effective pure palladium deposit via autocatalytic electroless plating, enhancing corrosion resistance and soldering ability without the 'black pad effect' compared to ENIG process. This process can be followed by a Nickel Sulphamate (18%) bath – an excellent barrier layer before gold plating, which prevents copper migration for boards without finger contact
Immersion Gold	Aurowell IM ENIG ENEPIG	Self-limiting process for SMT PCBs (HASL-free option) that ensures an extremely flat surface, excellent solderability, and bonding. Deposit thickness: 0.05-0.10 µm

