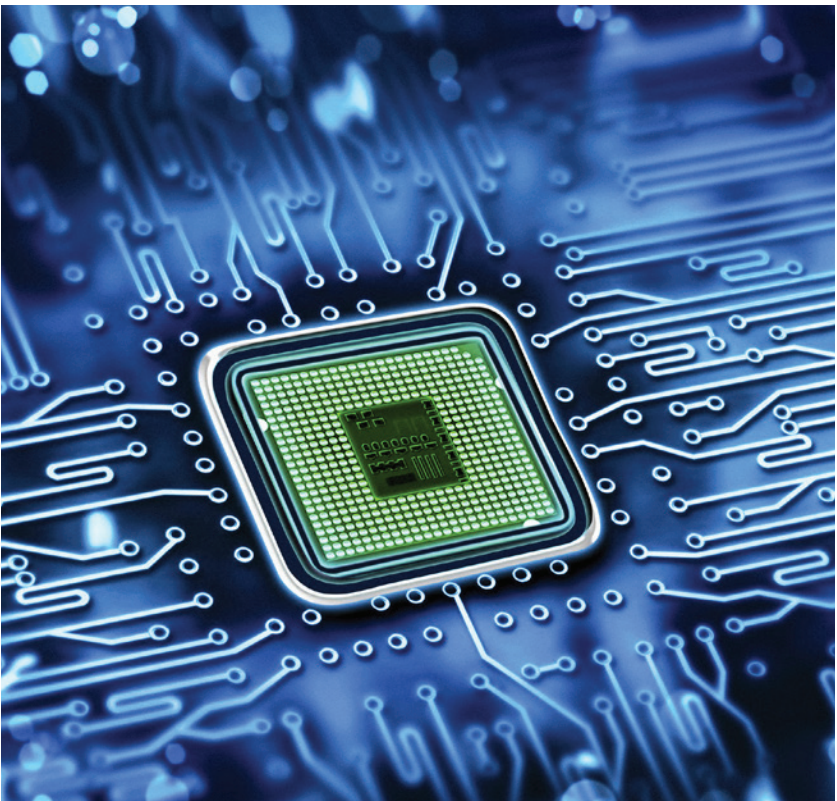




Dow Electronic Materials

Interconnect Technologies

Product Selection Guide (Americas)



Interconnect Product Selection Guide



Dow Electronic Materials, a global supplier of materials and technologies to the electronics industry, brings innovative leadership to the semiconductor, interconnect, finishing, display, photovoltaic, LED and optics markets. From advanced technology centers worldwide, teams of talented Dow research scientists and application experts work closely with customers, providing solutions, products and technical service necessary for next-generation electronics. These partnerships energize Dow's power to invent.

Dow's portfolio includes: CMP, lithography, metallization and ceramic materials for semiconductor applications; surface preparation, metallization and imaging materials for interconnect, electronic and industrial finishing, and photovoltaic applications; precursor materials for LED, solar and semiconductor manufacturing; OLED materials, display films, and display chemicals for LCD and plasma display fabrication; and zinc-based materials for optics.

What Our Technology Does

- Versatile plating technology used for metallizing a wide variety of boards from very high aspect ratio through holes to embedded microvias for the manufacture of the most complex end-use printed circuit boards
- Imaging technologies that help to define the finest of lines for dense circuitry

What is Unique

- Innovations that facilitate advanced circuitry design delivering reliability, improved yield, and improved cost of ownership for a large variety of printed circuit board applications

End-use Markets

- Computing
- Communication
- Consumer
- Automotive
- Industrial & Medical
- Military & Aerospace

Applications

- MLB (Multi Layer Board)
- HDI (High Density Interconnection)
- IC Substrate
- FPC (Flexible Printed Circuit)
- Optical Waveguide

Processes

- Inner Layer Bonding
- Image Transfer
- Metallization
- Making Holes Conductive
- Electrolytic Plating
- Final Finishes
- Optical Waveguide

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PWB Metallization – Making Holes Conductive

DESMEAR	
CIRCUPOSIT™ Hole Prep 211A	<ul style="list-style-type: none"> • CIRCUPOSIT™ Hole Prep 211A effectively cleans, conditions, activates hole-wall surface for optimum etching treatment by CIRCUPOSIT™ Promoter 3308 • Prepares surfaces for optimum treatment by the subsequent Promoter step
CIRCUPOSIT™ Hole Prep 3303	<ul style="list-style-type: none"> • CIRCUPOSIT™ Hole Prep 3303 effectively cleans, conditions, activates hole-wall surface for optimum etching treatment by CIRCUPOSIT™ Promoter 3308 • Prepares high Tg surfaces for optimum treatment by the subsequent Promoter step
CIRCUPOSIT™ Hole Prep 4126	<ul style="list-style-type: none"> • CIRCUPOSIT™ Hole Prep 4126 effectively cleans, conditions, activates hole-wall surface for optimum etching treatment by CIRCUPOSIT™ Promoter 3308 in horizontal applications
CIRCUPOSIT™ Promoter 3308	<ul style="list-style-type: none"> • Potassium and liquid sodium permanganate systems, which is regenerable with Dow Electronic Materials' designed electrolytic cell • Removes drill smear and debris, textures resin surfaces for optimum plating results
CIRCUPOSIT™ Neutralizer 3314	<ul style="list-style-type: none"> • CIRCUPOSIT™ Neutralizer 3314 is an integral portion of the patented CIRCUPOSIT™ 3000-1 Electroless Copper Plating Solution. It is a non-chelated neutralizer that removes manganese residues formed at the previous step
CIRCUPOSIT™ Neutralizer 3313-1 NEW! / CIRCUPOSIT™ MLB Glass Etch Additive	<ul style="list-style-type: none"> • Amine-based neutralizers to remove manganese residues while simultaneously etching exposed glass fibers • Glass Etch controllable from frost to etch back • REACH compatible neutralizer for electroless Cu applications
PTH PROCESS	
CIRCUPOSIT™ 3320 A Conditioner	<ul style="list-style-type: none"> • CIRCUPOSIT™ 3320A Conditioner contains a novel conditioning agent, which promotes the adsorption of a thin, uniform layer of catalyst, thus producing total electroless copper coverage while avoiding problems associated with over catalyzation • Dow Electronic Materials' conditioners are designed to provide the optimum palladium adsorption for all laminate and dielectric materials yielding complete electroless copper coverage
CIRCUPOSIT™ 3325 Conditioner	<ul style="list-style-type: none"> • Powerful catalyst promoter for complete coverage on a wide variety of substrates
CIRCUPOSIT™ 3328 Conditioner	<ul style="list-style-type: none"> • Mildly acidic conditioner for all dielectric material surfaces
CIRCUPOSIT™ 4224 Conditioner	<ul style="list-style-type: none"> • Alkaline conditioner for wide range of laminate materials • Excellent cleaning capability for both through-hole and blind microvia surfaces
Cleaner Conditioner 231	<ul style="list-style-type: none"> • Alkaline conditioner • Recommended for flex circuitry or difficult to plate surfaces
PREPOSIT™ Etch 748	<ul style="list-style-type: none"> • Peroxysulfate-based microetch system for reliable copper to electroless copper bonds • Dow Electronic Materials' steady state control systems available

PTH PROCESS (CONT.)	
CATAPREP™ 404 Pre-Dip	<ul style="list-style-type: none"> • Industry-standard colloidal tin-palladium catalyst • Complete system consisting of a low acid colloidal tin-palladium catalyst, liquid or solid pre-dip, catalyst salt additives, and control components
CATAPOSIT™ 44 Catalyst	<ul style="list-style-type: none"> • Industry-standard colloidal tin-palladium catalyst • Complete system consisting of a low acid colloidal tin-palladium catalyst, liquid or solid pre-dip, catalyst salt additives, and control components
ELECTROLESS COPPER (VERTICAL)	
CIRCUPOSIT™ 3350-1	<ul style="list-style-type: none"> • Self accelerating copper; EDTA-based • Fine-grain deposit an excellent choice for high performance multilayers and HDI (High Density Interconnection) applications • Deposits 1.25 µm (50 millionths of an inch) in 30 minutes
CUPOSIT™ 328L Copper Mix	<ul style="list-style-type: none"> • High-yield, “thin” electroless copper, tartrate-based • Very stable and simple to operate • Excellent copper-to-copper bonds achieved with all electroplate coppers • Deposits 0.3–0.5 µm (12–20 millionths of an inch) in 20 minutes
CIRCUPOSIT™ 8500 for Semi Additive Process Substrate Applications	<ul style="list-style-type: none"> • EDTA-free, tartrate based electroless Cu system • CIRCUPOSIT™ 8510, 8512, or 8515 Conditioners → Microetch → Acid Dip → CIRCUPOSIT™ ADV 8530 Alkaline Ionic Catalyst → CIRCUPOSIT™ 8540 Reducer → CIRCUPOSIT™ ADV 8550 Electroless Cu
ELECTROLESS COPPER (HORIZONTAL)	
CIRCUPOSIT™ 3350-1	<ul style="list-style-type: none"> • Self-accelerating copper, EDTA-based, suitable for horizontal applications • Fine grained deposit ideal for high performance multilayers and HDI (High Density Interconnection) applications • Deposits 0.3–0.5 µm (12–20 millionths of an inch) in 4–6 minutes
CIRCUPOSIT™ 6500 Ionic Catalyst Based Horizontal Electroless Cu Process	<ul style="list-style-type: none"> • Ionic catalyst designed for EDTA-free, tartrate based electroless Cu system • CIRCUPOSIT™ 3325 Conditioner → Microetch → CIRCUPOSIT™ 6520 Pre-Dip → CIRCUPOSIT™ 6530 Ionic Catalyst → CIRCUPOSIT™ 6540 Reducer → CIRCUPOSIT™ P-6550 Electroless Cu
DIRECT PLATE (PALLADIUM-BASED)	
CONDUCTRON™	<ul style="list-style-type: none"> • Unique palladium-based system that creates one of the most conductive direct plate coatings on the market • No reliance on a post-coating microetch • May be used in vertical or horizontal applications • Process Sequence: Conditioner > Microetch > Glass Conditioner > Pre-Dip > Conductron Activator > Acid Copper Plate
DIRECT PLATE (GRAPHITE-BASED)	
GRAPHITE 2000™	<ul style="list-style-type: none"> • Graphite-based direct plate system for making holes conductive • Stable colloidal system • Process Sequence: Hole Prep > Promoter > Neutralizer > Graphite > Micro-Etch

PWB Metallization Electrolytic Plating

ALKALINE CLEANER	
AL-CHELATE™	<ul style="list-style-type: none"> Designed for use as a general-purpose strong alkaline cleaner for cleaning copper surfaces
MICRO-ETCHANT	
PREPOSIT™ Etch 748	<ul style="list-style-type: none"> Peroxyulfate-based Automatic feed and bleed control
ACID CLEANERS	
RONACLEAN™ EVP-209	<ul style="list-style-type: none"> Non-chelated acid cleaner
RONACLEAN™ EVP-210S Cleaner	<ul style="list-style-type: none"> Sprayable, non-foaming cleaner for use prior to photoresist coating No alkyl phenol ethoxylates (APEs) or strong chelating agents
ACID COPPER (VERTICAL)	
ELECTROPOSIT™ 1000	<ul style="list-style-type: none"> Low current density (0.5-1 ASD, 5-10 ASF) DC plating for the most demanding technologies (HDI) High aspect ratio plating and excellent surface distribution Meets the criteria for backplane thick board plating
COPPER GLEAM™ 125-HS, CLX	<ul style="list-style-type: none"> Medium current density (1.5-2.5 ASD, 15-25 ASF) Good productivity, applicable to the majority of products plated today These plating systems are high performance, robust and with a wide operating window
COPPER GLEAM™ HGX	<ul style="list-style-type: none"> DC acid copper plating process for flexible circuit applications Improved plating appearance on rolled annealed copper substrates Reduced internal stress with good thermal reliability
ACID COPPER (HORIZONTAL)	
COPPER GLEAM™ HS-200	<ul style="list-style-type: none"> Two component DC additive systems designed to operate at high current densities (5-10 ASD, 50-100 ASF) Bright, uniform deposit Fully compatible with insoluble anodes
ACID COPPER (PULSE)	
COPPER GLEAM™ CuPulse™	<ul style="list-style-type: none"> Designed for copper plating of printed circuit boards using PPR current Combination of the CuPulse™ formulation and optimized PPR waveforms can dramatically reduce acid copper plating times compared to traditional DC electroplating
ACID COPPER (VIA FILL)	
MICROFILL™ EVF Copper Via Fill	<ul style="list-style-type: none"> Capable of filling microvias in high efficiency Operates at current densities between 1–3 ASD (10–30 ASF) Bright, highly ductile, levelled deposit Compatible with soluble anodes DC process with insoluble anodes for simple operation and elimination of idle time effects

ACID COPPER (THROUGH HOLE FILL)

MICROFILL™
THF-100

- Designed to fill through holes in HDI and IC packaging applications
- Operates at 1-2 ASD (10-20 ASF)
- Compatible with insoluble anodes

TIN PLATING (SULFURIC ACID BASED)

RONASTAN™
EC-1 **NEW!**

- Sulfuric Acid based tin plating bath for etch resist applications
- Smooth, fine-grained deposit over a wide current density range



PWB Metallization Final Finish

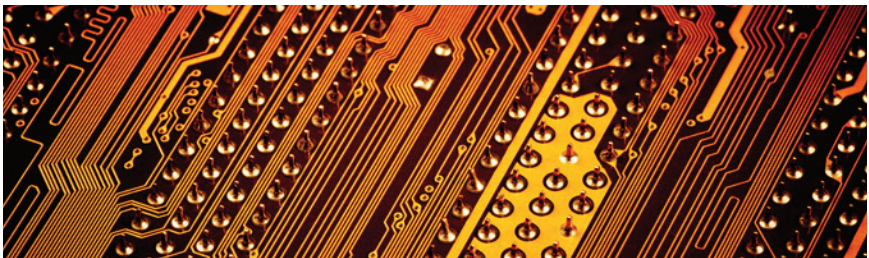
ACID CLEANERS	
RONACLEAN™ EVP 209	<ul style="list-style-type: none"> Acidic cleaner, specially designed for removing remaining residues from developing aqueous, alkali strippable dry films
RONACLEAN™ NPTH 215 Cleaner NEW!	<ul style="list-style-type: none"> Prevents plating of electroless Ni in non-plated through holes (NPTH)
MICRO-ETCHANT	
PREPOSIT™ Etch 748R Modified Microetch NEW!	<ul style="list-style-type: none"> For use with RONACLEAN™ NPTH 215 Cleaner in ENIG applications
PREPOSIT™ Etch 748	<ul style="list-style-type: none"> Peroxy-sulfate based Mildly-acidic micro-etch providing excellent copper adhesion Stable and active for longer periods of time while maintaining consistent etching rates
CATALYSTS	
RONAMERSE™ SMT Catalyst	<ul style="list-style-type: none"> Palladium-chloride-based
RONAMERSE™ SMT Catalyst CF	<ul style="list-style-type: none"> Palladium-sulfate-based
ELECTROLESS NICKEL	
DURAPOSIT™ SMT 88	<ul style="list-style-type: none"> 8–10% P content electroless nickel with excellent corrosion resistance and solderability Low skip plating risk
IMMERSION GOLD	
AUROLECTROLESS™ SMT 520 Immersion Gold	<ul style="list-style-type: none"> Designed to produce a uniform fine-grained electroless deposit of pure gold on metallic substrates including electroless nickel and electroless palladium Lower gold content notably reduces operating costs Applied as part of ENIG process The AUROLECTROLESS™ SMT 520 Immersion Gold bath is easy to control and has a high tolerance to contaminants
IMMERSION TIN	
TINPOSIT™ LT-34 Immersion Tin	<ul style="list-style-type: none"> Advanced surface finish of immersion tin for lead-free assembling Whisker-free and dendrite-free deposit Fine-grained deposit offering excellent solderability and reliability Notably reduces galvanic corrosion and solder mask attack Deposits 1.0–1.2 μm (40–50 millions of an inch) tin in 10–13 minutes

PWB Imaging Materials

DRY FILM	
ALPHO NIT ² 200 Series	<ul style="list-style-type: none"> Alkaline etching application Acid plating application (Cu, tin, tin/lead) Available thicknesses: 15, 25, 30, 40, 50 μm
LAMINAR ² UDF-7200 Series	<ul style="list-style-type: none"> LDI photo resist designed to respond to 365 and 405nm wavelengths Compatible with direct imaging equipment using 365nm laser, LED or 405nm laser light sources Universal resist system with alkaline etch and gold plating capabilities Low foaming with minimal developer residues
LAMINAR ² E-7600 Series	<ul style="list-style-type: none"> Acid compatible resist Exceptional tenting capability Available thicknesses: 1.5 and 2.0 mil
LAMINAR ² E-9000	<ul style="list-style-type: none"> Acid etch compatible inner layer and chemical milling resist Excellent conformance capabilities Available in 1.0 and 1.2 mil thicknesses
LAMINAR ² E-9200 Series	<ul style="list-style-type: none"> A universal photo resist system Compatible with ENIG and immersion silver Available in 1.3, 1.5, 2.0 2.5, 3.0, and 4.0mil thickness
LAMINAR ² UD-900 Series	<ul style="list-style-type: none"> Specifically designed for laser direct imaging Compatible with inner layer manufacturing and outer layer plating and etching applications Available in thickness up to 4.0 mil
ACID CLEANER	
RONACLEAN™ EVP-210S	<ul style="list-style-type: none"> Sprayable, low-foaming cleaner for use prior to photoresist coating Minimum attack on copper
ALKALINE CLEANER	
AL-CHELATE™	<ul style="list-style-type: none"> Designed for use as a general-purpose strong alkaline cleaner for cleaning copper surfaces
CIRCUBOND™ Cleaner 140	<ul style="list-style-type: none"> Low foaming, sprayable alkaline cleaner Minimal attack on copper surfaces
MICRO-ETCHANT	
PREPOSIT™ Etch 748	<ul style="list-style-type: none"> Peroxy-sulfate based Mildly acidic micro-etch offering excellent copper adhesion Stable and active for longer periods of time while maintaining consistent etch rates

INKJET RESISTS	
LITHOJET™ 210	<ul style="list-style-type: none"> • Etch resist • Very high chemical resistance to acid solutions • UV curable • Alkaline strippable • Used in chemical milling applications
LITHOJET™ 223	<ul style="list-style-type: none"> • Etching and plating resist • Very high chemical resistance to acid and alkaline solutions • UV curable • Alkaline strippable • Used in printed circuit board applications
LITHOJET™ 240	<ul style="list-style-type: none"> • Compatible with acid or alkali etching • High chemical resistance • UV curable
LITHOJET™ 250	<ul style="list-style-type: none"> • Plating resist compatible with plating chemistries • Designed for high resolution plating • Very high chemical resistance to acid and alkaline solutions • UV curable • Alkaline strippable • Used in selective plating of connectors, electrolytic gold, nickel, copper and electroless nickel
CUPRIC REGENERATION	
CUOX™ 310	<ul style="list-style-type: none"> • A sodium chloride regenerant designed to replace chlorine gas in most cupric chloride etching applications and is designed for use with the TEKtroller™ CC-305 Automatic Cupric Chloride Etchant Control System
LIQUID PHOTORESISTS	
PHOTOPOSIT™ SN68H-3 NEW!	<ul style="list-style-type: none"> • Robust, high yield, negative tone photoresist • Optimized for use in double sided roller coaters • High image contrast, and good stackability • Fast exposure speeds
PHOTOPOSIT™ SP24D	<ul style="list-style-type: none"> • Positive working photoresist designed for inner layer fabrication and photochemical machining • Can be used on virtually all metals and alloys including copper, stainless steel, aluminum, and on glass, ceramic and many other substrates • Dried film is extremely hard and stackable
DEVELOPERS	
RESOLVE™ 211	<ul style="list-style-type: none"> • Aqueous developer for photoresist; 450 g/L potassium carbonate solution with proprietary equipment cleaner
RESOLVE™ 211C	<ul style="list-style-type: none"> • Aqueous developer for photoresist; 600+ g/L potassium carbonate solution with proprietary equipment cleaner
RESOLVE™ 212R	<ul style="list-style-type: none"> • Cost-effective, regenerable aqueous developer for photoresist, 450 g/L potassium carbonate solution with proprietary equipment cleaner; notably higher loading capacity than RESOLVE™ 211 Developer

ANTI-FOAMS	
ANTIFOAM 2750, BBE	<ul style="list-style-type: none"> • Designed as clean, highly-concentrated and effective antifoam, is fully water miscible and is to be used diluted with water for maximum dispersion and economy • Completely water miscible and easy rinsing
PHOTORESIST STRIPPERS	
SURFACESTRIP™ 406-1	<ul style="list-style-type: none"> • A semi-aqueous stripper that can be used as an outstanding final polish for fine line outer layer film stripping
SURFACESTRIP™ 419	<ul style="list-style-type: none"> • Excellent yield and stripping speed for inner layer and outer layer application
SURFACESTRIP™ 446-1	<ul style="list-style-type: none"> • Concentrated to reduce operating costs • Rapid strip rate for higher conveyor speeds in spray operations • No oxidation for improved AOI inspectability
SURFACESTRIP™ 448	<ul style="list-style-type: none"> • Excellent yield and stripping speed for inner layer and outer layer application
SURFACESTRIP™ 466-1	<ul style="list-style-type: none"> • Universal stripper for inner layer and fine line outer layer applications
OXIDE REPLACEMENT	
CIRCUBOND™ Cleaner 140	<ul style="list-style-type: none"> • Low-foaming alkaline-spray cleaner • Minimal attack on copper surfaces
CIRCUBOND™ PreDip 2217	<ul style="list-style-type: none"> • Designed to provide a surface compatible with either CIRCUBOND™ 2200 or CIRCUBOND™ 2200 Plus Treatment Bath
CIRCUBOND™ 2200 Plus	<ul style="list-style-type: none"> • Extremely consistent and high peel strength • High copper loading of above 45 g/L • Excellent peel strength on full range of lead-free and high Tg prepreg • Compatible with most halogen-free high-Tg and mid-Tg prepregs with high peel strength
SUPPLEMENTARY PRODUCTS	
ANTITARNISH™ 7130	<ul style="list-style-type: none"> • Provides long lasting anti-tarnish effect • Neutralizes electroless Cu residues • Improves inner layer and outer layer resist adhesion
ENVIROSTRIP™ 785	<ul style="list-style-type: none"> • High loading tin and tin/lead stripper



NOTE: Before using any product mentioned herein, consult the product's Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) for details on product hazards, recommended handling precautions and product storage. Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products – from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

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