BEST-IN-CLASS PRODUCTS FROM THE WORLD'S STRONGEST BRANDS

Insulectro is the largest North American distributor for materials used in the fabrication of printed circuit boards, composite manufacturing, and the new, highly innovative printed electronics technology. Keeping up with changing technologies can be a challenge. Insulectro is uniquely positioned to keep its customers current with cutting-edge technologies as a one-stop shop for materials and intense product knowledge of these highly-engineered materials. As technology continues to evolve, manufacturers need new breakthrough products, creative designs, and a strong, dependable supply chain. Insulectro exists to help its suppliers and customers thrive. Then, now, and later.

NORTH AMERICAN STOCKING LOCATIONS

CALIFORNIA (S)
Corporate Headquarters
20362 Windrow Drive
Lake Forest, CA 92630
855-995-0200

CALIFORNIA (N)
2345 Paragon Drive
San Jose, CA 95131

TEXAS
2301 Crown Ct
Irving, TX 75038

ARIZONA
6615 West Boston St
Chandler, AZ 85226

MINNESOTA
9930 West 69th St
Eden Prairie, MN 55344

COLORADO
21303 E. 32nd Pkwy
Aurora, CO 80011

OREGON
1523 Poplar Street
Forest Grove, OR 97116

CANADA
237 Finchdene Square
Unit 1
Scarborough ON M1X 2E1

NEW HAMPSHIRE
8 Akira Way
Londonderry, NH 03053

ILLINOIS
200 Covington Drive
Bloomingdale, IL 60108

UTAH
809 W. 800 N. Wasatch Wrhs
Logan UT 84321

www.insulectro.com 949-587-3200

Enabling customers to build better circuits, faster.

Printed Circuit Boards are the vital building blocks for controls, communications, instrumentation, and computational intelligence used in industrial and manufacturing systems.

PCBs are vital for military and defense intrastructure. The need for highly reliable circuits is essential for weapons systems guidance, flight control, satellites, and avionics.

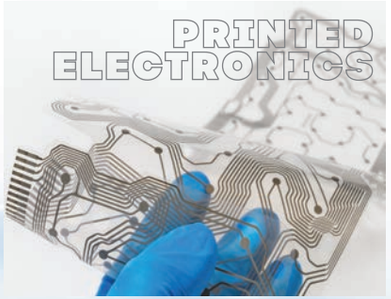
Medical electronic devices include pacemakers, defibrillators, drug-releasing pumps, hearing aids, and diagnostic equipment for measuring, monitoring, and recording such body functions as heartbeat and brain waves.

This specialized, fast developing industry uses 5G, wireless, personal digital assistant, and a portable or mobile computer that's used for the purpose of transmitting data whether through a wired or wireless network.

INSULECTRO

Consumer electronics refers to the entire range of OEM-produced products containing electronic circuit boards intended for personal or non-commercial use.

Automotive electronics applications are rapidly growing. Systems include engine and battery management, power, sensors, and *Lidar* for collision avoidance and autonomous driving capabilities.



Printed Electronics is an additive process utilizing a variety of printing methods used to create circuitry by applying conductive inks & pastes on virtually any substrate. Also used in adjacent industries like construction.

Cloud computing allows high-speed data analytics for complex processing allowing AI and machine learning to become a reality.

Markets we serve.

ELITE MATERIAL CO., LTD

LAMINATES

RESIN SYSTEMS FOR PCB LAMINATES

- **EM-827(I)**
- **EM-370(Z)**
- **EM-528**
- **EM-528K**
- **EM-890K(A)**

ELECTRONIC MATERIALS

POLYIMIDES

POLYIMIDES SYSTEMS FOR PCBS

- **85N (High Temperture)**
- **85HP (High Performance)**
- **86HP (High Performance)**

PREPREGS FOR RIGID-FLEX & CAVITY PCBS

- **37N (Low Flow Prepreg)**
- **38N (2nd Gen Low-Flow Polyimide Prepreg)**
- **49N (Multifunctional Epoxy Low-Flow Prepreg)**
- **51N (Lead-Free Epoxy Low-Flow Prepreg)**

High performance products for mission-critical PCBs.

EMC laminates are designed for very complex PCBs, utilizing advanced building blocks from ultra-thin prepregs to highly controlled cores. Examples of applications include "Any-layer" PCBs, mSAP, IC substrate, high layer count (HLC)/ high speed digital (HSD) and radio frequency (RF).

Arlon specializes in Polyimide, Low Flow, and CTE-controlled PCB products.

Arlon is recognized for the highest quality standards in the industry and is positioned to support our customers most technological challenges through innovating technologies.

EMC LAMINATES

RESIN SYSTEMS FOR PCB LAMINATES

EM-827(I) - Designed for high thermal reliability with excellent CAF resistance. High Tg / CAF Resistance / Lead Free.
Applicable IPC Slash Sheets: IPC-4101 /98, /99, /101, /126; IPC-4103 /250, /550.

EM-370(Z) - Designed for high thermal reliability with excellent CAF resistance. High Tg/High Reliability/Halogen Free.
Applicable IPC Slash Sheets: IPC-4101 /127, /128, /130; IPC-4103 /250, /550.

EM-528 Multiple lamination and high thermal reliability. High Tg/High Reliability/Halogen Free.
Applicable IPC Slash Sheets: IPC-4103 /240, /540.

EM-528K Multiple lamination and high thermal reliability applications. High Tg/High Reliability/Halogen Free.
Applicable IPC Slash Sheets: IPC-4103 /240, /540.

EM-890K(A) Designed for high thermal reliability with excellent CAF resistance. High Tg/High Reliability/Halogen Free
Applicable IPC Slash Sheets: IPC 4101 /134; IPC-4103 /230, /530.

ARLON POLYIMIDES

POLYIMIDE SYSTEMS FOR PCBS

85N (High Temperture) - a 250°C high glass transition pure polyimide resin system that provides superior thermal resistance to high-temperature end-use electronics.
Meets requirements of IPC-4101/41.

85HP (High Performance)- best-in-class 250°C high glass transition temperature polyimide resin system available
Validated to three IPC-4101 slash sheets 40, 41, & 43.

86HP (High Performance) - revolutionary addition to Arlon's best-in-class high performance polyimide laminate systems engineered to meet high temperature, electrical, and mechanical performance.
Meets IPC-4101 slash sheets 40, 41, and 43.

PREPREGS FOR RIGID-FLEX AND CAVITY PCBS

37N (Low Flow Prepreg) - a 200°C glass transition temperature polyimide low-flow resin system designed for bonding multilayer rigid flex, heat sink attachment to MLBs
Meets requirements of IPC-4101/42.

38N (2nd Gen Low-Flow Polyimide Prepreg) - Second-generation 200°C glass transition temperature polyimide low-flow resin system designed to improve adhesion and bond strength to Kapton® polyimide films, copper and others.
Meets requirements of IPC-4101/42.

49N (Multifunctional Epoxy Low-Flow Prepreg) - low-flow epoxy prepreg engineered for bonding multilayer epoxy rigid-flex or attaching heat-sinks to multilayer epoxy PCBs.
Meets requirements of IPC-4101/26.

51N (Lead-Free Epoxy Low-Flow Prepreg) - non-DICY multifunctional epoxy low-flow prepreg system designed to provide high reliability through lead-free solder operations.
Meets requirements of IPC-4101/126.

DUPONT™

PYRALUX® AP
PYRALUX® AG
PYRALUX® HP
PYRALUX® AC
PYRALUX® HT
PYRALUX® TK
PYRALUX® LF
PYRALUX® FR
PYRALUX® APR

FLEXIBLE LAMINATES

PYRALUX® FLEXIBLE CIRCUIT MATERIALS

DuPont offers a comprehensive, industry-leading portfolio of Pyralux® flexible circuit materials and systems designed to meet today's and the next generation's design challenges.

The Pyralux® portfolio includes a diverse collection of core dielectric materials and customized dimensional constructions that enable the designer and manufacturer of complex circuits to deliver high performance solutions. DuPont Pyralux® copper clad laminates, bondplys, coverlays, and adhesive systems offer excellent functional performance and high reliability and allow for the fabrication of thin, solderable, high density electrical interconnects for single and double-sided, multilayer flex and rigid flex applications.

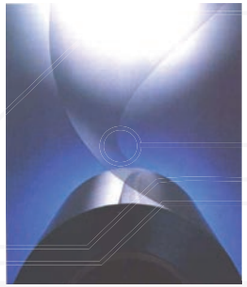
THE PYRALUX® FAMILY

Pyralux® AP	All polyimide double-sided copper clad laminate for high reliability flex and multilayer flex circuitry.
Pyralux® AG	All polyimide double-sided copper clad laminate offered in rolls and sheets for commercial, wireless, or automotive designs.
Pyralux® HP	HP is the newest adhesive to the Pyralux® line up. It is low-loss epoxy based adhesive that is ideal for any situation where signal integrity is a driving factor in the design.
Pyralux® AC	An all polyimide single-sided copper clad laminate ideal for applications that require thin, light, high density circuitry along with chip-on-flex attachment
Pyralux® HT	Copper clad laminate and bonding system for high temperature and high performance flex and multilayer flex circuitry
Pyralux® TK	Featuring a unique Kapton® Polyimide and Fluoropolymer film base dielectric double-sided copper clad laminate and bondply ideal for high speed digital and high frequency flexible circuit applications
Pyralux® LF	Acrylic-based copper clad laminates, coverlays, bondplys and sheet adhesives that have been the industry standard in high reliability applications in the consumer electronics industry for over 35 years.
Pyralux® FR	Acrylic-based flame retardant copper clad laminates, coverlays, bondplys and sheet adhesives for products requiring UL rating
Pyralux® APR	An all polyimide double-sided resistor laminate where reliable resistor technology, temperature tolerance, and robust processing are required

DUPONT™

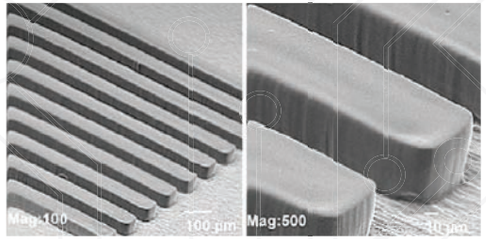
RISTON®DIRECT IMAGE
RISTON® LASER SERIES
RISTON® SPECIAL FX
RISTON® MULTIMASTER
RISTON® ETCHMASTER
RISTON® GOLDMASTER
RISTON® PLATEMASTER
RISTON® TENTMASTER
YIELDMASTER® 2000

DRY FILM PHOTORESIST



RISTON® DRY FILM PHOTORESIST MATERIALS

DuPont™ Riston® dry film photoresist revolutionized the way printed circuit boards were fabricated when it was invented by DuPont over forty years ago. Fabricators challenged to produce denser and more complex boards choose DuPont for improved product and process solutions that keep them both competitive and profitable. Explore the Riston® line of high performance dry film photoresists for your next PCB application.



Fineline imaging with Riston®

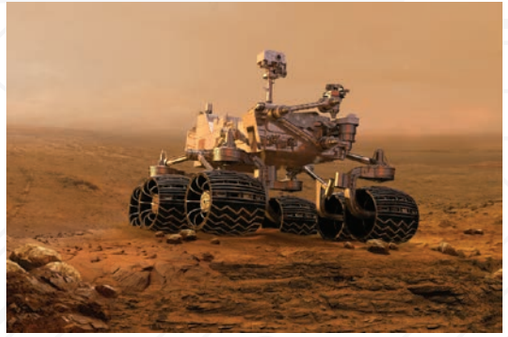
RISTON® DRY FILM PHOTORESIST

Riston® Direct Image	Series of direct imaging photoresists designed for optimum high performance on dual band exposure equipment for print-and-etch and plating applications. This film series offers improved adhesion as well as resolution below 1 mil.
Riston® Laser Series	Specialty product for laser direct imaging possessing ultra-high photospeed.
Riston® Special FX	Series of photoresists providing high resolution capabilities.
Riston® MultiMaster	Series of general purpose photoresists with alkaline etch and gold plating capabilities.
Riston® EtchMaster	Series of photoresists giving high productivity/high resolution in acid print-and-etch and chemical milling.
Riston® GoldMaster	Thick plating resist (75 and 100 micron) for selective or pattern Ni/Au plating.
Riston® PlateMaster	Cu/Sn, Cu/SnPb plating film providing plated line uniformity, fine line resolution, and wide surface tolerance on direct metal, panel plate and electroless surfaces.
Riston® TentMaster	Film giving good conformation and reliable performance in tent-and-etch as well as acid print-and-etch.
YieldMaster® 2000 Wet Lamination System	The YieldMaster® 2000 Wet Lamination System for cut-sheet and hot-roll laminators. This system provides enhanced yields without loss of productivity.

INTERRA™ HK04

THIN COPPER CLAD

Innovative Thin Copper Clad Laminates Push Electrical Boundaries



DuPont™ Interra™ thin copper clad laminates are specifically designed for use in multilayer rigid printed circuit boards.

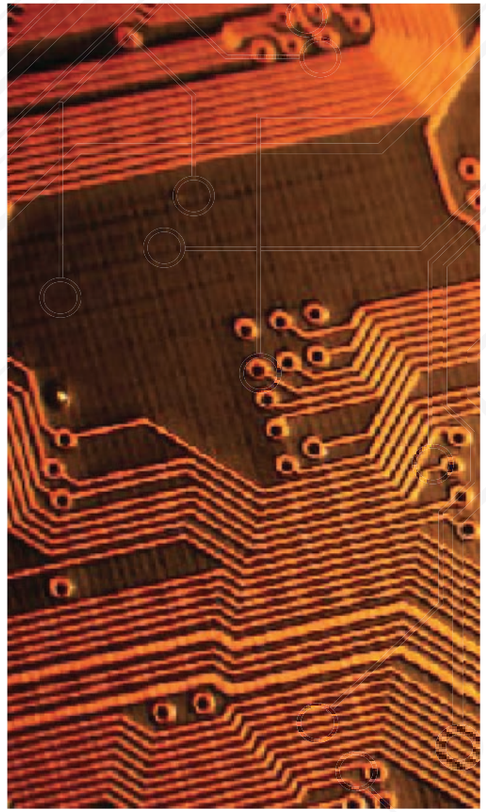
All Interra™ thin copper clad laminates utilize low-profile electrodeposited (ED) copper laminated to thin polyimide based dielectric. This dielectric is engineered to have superior adhesion to copper than traditional glass-reinforced materials utilized in rigid boards.

The polyimide dielectric is based on DuPont™ Kapton® technology, but is specifically engineered to have low dielectric loss, high dielectric isolation and strength, and tight thickness tolerance which are inherent benefits compared to traditional rigid circuit board materials.

MEET INTERRA™

Interra™ HK04

DuPont™ Interra™ embedded planar capacitor laminate is used in making thinner, more efficient power and ground planes within a multilayer printed wiring board. It provides very low impedance at high frequency, power bus decoupling, and electromagnetic interference reduction. Interra™ HK04 saves PWB cost by replacing SMT by-pass capacitors, their PTHs and associated costs. Interra™ HK04 is a rugged polyimide dielectric laminate that can be processed similar to thin flexible circuit laminate through the develop/etch/strip process steps. The HK04 dielectric is flexible and can be imaged and etched to remove copper on both sides of the dielectric at the same time. HK04 provides high reliability through PWB processing and in extreme PWB conditions (ex: the Mars Rover). DuPont™ Interra™ embedded planar capacitor laminate is available with two different base polyimide films.



PACOTHANE TECHNOLOGIES
Division of Multilayer Worldwide Enterprises LLC

PACOTHANE®
PACOPADS®
TRIPAK®
PACOGARD®
PACOCLUTCH™
PACOVIA
PACOTHANE® PLUS
PACOFLEX™ ULTRA
THERMOPADS™
THERMOFILM™
PACOQUICKPRESS™

FILMS & PADS

PACO·CLUTCH™

All-in-One Conformable Release Film Package

Innovative processing solutions

Pacothane services the worldwide PCB market, which includes rigid multilayer, rigid/flex, cover-layer flex, flexible multilayer, copper and unclad laminates. These circuit boards are integrated into a wide variety of applications and markets that include telecom, data communications, high-speed computing, mobile devices, military, smart cards, medical and effectively all electronic products.

PACOTHANE® LAMINATION ASSIST

PACOTHANE® is a high temperature-resistant Release Film specifically engineered for laminating rigid, flexible and exotic substrate Printed Circuit Boards. It is manufactured in-house under a patented process, with stringent quality controls.

PACOPADS® are a line of press pads specifically engineered to improve the process of laminating rigid multi-layer and flexible Printed Circuit Boards. They serve two primary functions: to accurately control heat input and to equalize the pressure applied to the panel surface.

TRIPAK® is a Pacothane-clad press pad that is specifically engineered to control the variables associated with the lamination process of Printed Circuit Boards. TRIPAK's primary function is to deliver consistent, repeatable heat rise, equalize applied pressure and economically incorporate the benefits of Pacothane release film to the lamination process.

PACOGARD® Panel Separator or "Slip" Sheets are a line of proprietary, process-enhancement products specifically engineered to protect both inner & outerlayer PCB Panels from scrap resulting from handling damage, excessive oxidation and airborne particulates. PACOGARD also significantly reduces "False Alarms" at AOI.

PACOCLUTCH™ is a two-side releasable film, engineered specifically for use by PCB Multilayer manufacturers that laminate etched copper laminate cores, in place of copper foil in the outer layer lamination process.

PACOVIA Two-Component System (PACOVIA and PACOPADS®) is a performance-driven line of high-temperature, resin-blocking release films. The PACOVIA System is specifically engineered to enhance sequential lamination of buried and blind via designed rigid Printed Circuit Boards.

PACOTHANE® PLUS is a conformable Release Sheet that is specifically engineered for use as a component of the Pacothane® Plus System for the production of flexible Printed Circuits (base stock, coverlay, and rigid-flex). Pacothane® Plus brings standardization and predictability to the flex laminating process and offers tangible process advantages.

PACOFLEX™ ULTRA is specifically engineered for the lamination of coverlayers to flexible Printed Circuit Boards. This product is a robust highly conformable release film which, when exposed to heat and pressure, becomes extremely soft and pliable for superior conformance to intricate flex part topographies.

THERMOPADS™ comformable press pads for extreme temperature usage

THERMOFILM™ easy release film for extreme temperature usage

PACOQUICKPRESS™ two-sided release film engineered for high temperature quick press PCB laminations

LCOA™

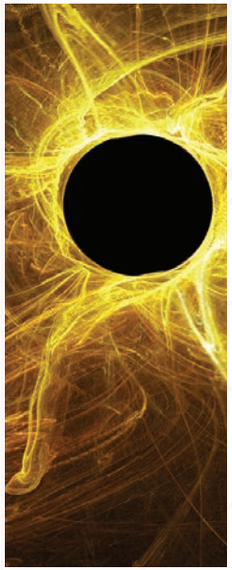
ENTRY
- BULLSEYE ™
- BULLSEYE ™ BLU
- EO+ ™
- PHENOLIC

BACKUP
- SLICKBACK ™
- SPECTRUM ™ GOLD PLUS
- POLARBACK ™
- CONFORMAT ™
- PHENOLIC

BACKUP & ENTRY

Drill a better hole.

Accuracy. . . Efficiency. . . Reliability. . .



LCOA™ designs, develops, and manufactures precision quality backup and entry solutions used in the manufacturing of printed circuits boards.

LCOA™ has been located in Southern California since its inception and has become the North American leader in backup and entry sales while also selling products on five continents and in over 15 countries around the world.

Today, LCOA™ supplies drilling solutions to many of the largest PCB manufacturers in the world.

LCOA™ is the technological leader for backup and entry – all to help drill a better hole.

ENTRY

BULLSEYE Drill Registration Sheet

Tightest Hole Location
Minimized Drill Deflection
One Product for All Drill Sizes
Increased Drilling Capacity

- Thickness: 0.22mm ±0.025mm
- Surface hardness: >50 shore "D"
- Non-conductive
- Engineered Aluminum Alloy

bLU BULLSEYE REGISTRATION SHEET

Non-contaminating
Minimized burring
Maximum Efficiency
Proven Accuracy

- Thickness: 0.25mm ±0.025mm
- Surface hardness: >50 shore "D"
- Non-conductive
- Engineered Aluminum Alloy

eo+ EO PLUS COMPOSITE ENTRY MATERIAL

Minimized burring
Increased hole quality
Reduced drill temperature
Predictable performance

- Thickness: 0.305mm ±0.038mm
- Surface hardness: >50 shore "D"
- Conductive
- Engineered Aluminum Alloy

BACKUP

SLICKBACK® Lubricated Drill Backup

Extended Tool Life
Increased Stack Height
Best Hole Quality
Increased Throughput

- Thickness: 2.44mm ±0.127mm
- Density: > 830 kg/m³
- Surface hardness: > 75 shore "D"
- Lubricated paper on HDF core

Spectrum gold PLUS

Minimized Burring
Increased Hole Quality
Reduced Drilling Temperatures
Greater Return on Investment

- Thickness: 2.41mm ±0.127mm
- Density: > 830 kg/m³
- Surface hardness: > 75 shore "D"
- Non-lubricated paper on HDF core

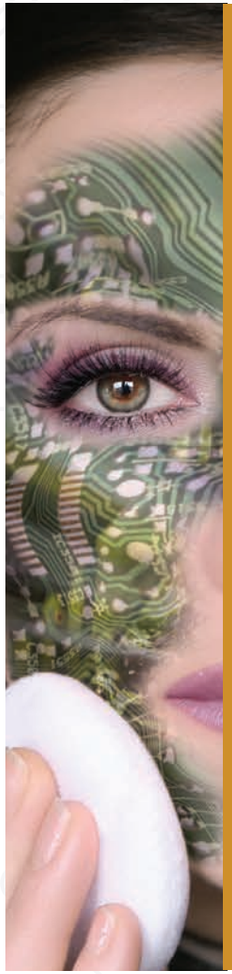
PolarBack™ HIGHER PRODUCTIVITY AT A COOL PRICE

Improved hole quality
No phenolic resins
Designed for drilling PCBs
Prevention of burrs

- Thickness: 2.50mm ±0.15mm
- Density: > 830 kg/m³
- Surface hardness: >80 shore "D"
- Melamine coated on HDF core

CONFORMAT CONFORMAL BACKUP SHEET

Prevention of burrs on panels with image transfer
Minimizes rework



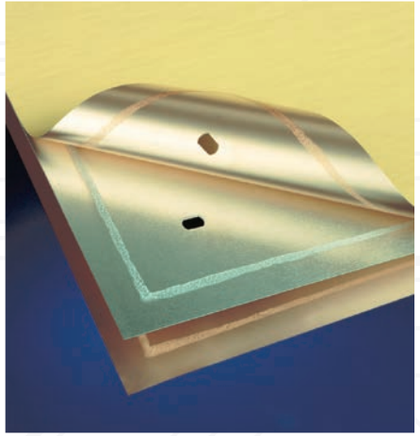
SUPERIOR DRILLING PRODUCTS

CAC INC

COPPER-ALUMINUM-COPPER (CAC™)
COPPER-STEEL-COPPER (CSC™)
DUOFOIL (Release Coated Aluminum)

LAMINATION ASSIST

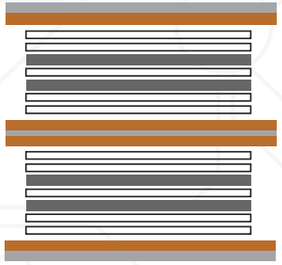
Clean & Easy

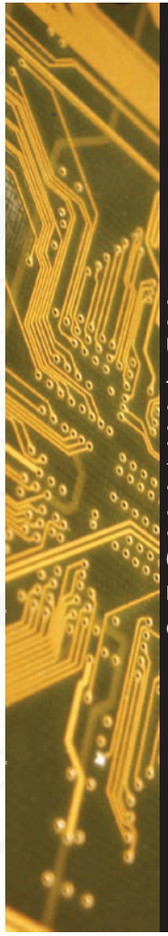


CAC Inc, is a domestic manufacturer of CAC™ and CSC™ products. These products support established copper foils down to 6μ and new emerging foils with low to very-low profile treatments.

They can be attached to one or both sides of a steel or aluminum carrier, supporting the lamination department.

Providing superior panel surface quality, mitigating foreign object or debris concerns, improve layup efficiencies and supporting press stack coefficient of thermal expansion.





ADVANTAGES

Increased lamination throughout – Using CSC™ panels which are 7.5 times thinner than traditional steel separator plates supports more panels per press opening.
In addition to offering consistent CTE within the press stack with image transfer reduction benefits and single operator breakdown benefits too.

Less material handling – In conventional pin lamination of a ten-high book, 31 individual copper foil and aluminum separator components must be carefully placed over pins in the lay-up of a multilayer book. CAC™ reduces the number of components that must be handled to 11, for a 65% reduction.

Reduced operator labor – In the same ten-high lay-up, operators must wipe 40 surfaces to ensure the best possible surface cleanliness. Because CAC™ delivers pre-sealed from the factory, operator wiping of critical surfaces is no longer necessary. The combined productivity gains are typically 30% to 50%.

Elimination of foil wrinkles – Handling and registration of thin copper foil onto lamination fixture pins can cause handling wrinkles, a major source of foil pinholes. Another source of foil wrinkles, thermal expansion mismatch between copper foil and steel separators, is eliminated by the use of aluminum separators.

Improved thermal conductivity – the use of CAC™ can reduce inherent temperature differences in a lamination book due to its improved thermal conductivity as compared to steel separators.

KYOCERA

DRILLS
ENDMILLS
ROUTERS
SCORING/ENGRAVING
COUNTERSINKS
REPOINT

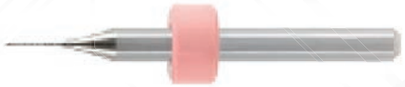
DRILS, ENDMILLS, ROUTERS

Technology that extends tool life and reduces drilling cost.

Kyocera Precision Tools designs and manufactures tight tolerance precision carbide cutting tools for PCB applications. Products include drills, routers, end mills, and specialized cutting tools ranging from 0.05mm to 6.70mm diameters (0.0020" - 0.2638").

Kyocera Precision Tools' products are manufactured with the finest carbide grades available. Their product development laboratory continually evaluates new materials from carbide manufacturers around the world. As a result, Kyocera applies the latest developments in material science to the design and manufacture of precision cutting tools.

Kyocera Precision Tools is also a world leader in the area of drill sharpening and tool management services.



DRILLS

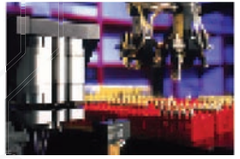
Kyocera provides tools designed specifically for controlled depth, thick panels for both through hole and back drilling.

ENDMILLS

Kyocera provides a range of End Mills from single to four flute optimized for processing the full range of materials used in printed circuit boards, including specialty designs for rigid and rigid flex.

ROUTERS

Kyocera provides a full range of router designs for internal and external routing, including specialty tools for gold tab and for brittle materials prone to fracturing.



REPOINT

Kyocera has long been an industry leader in repointing delivering superior quality with excellent turn times to support their customer base. Recent investments in additional automated re-point equipment ensure customers are receiving precisely repointed tools for optimum hole wall quality.

We supply and support the best advanced materials for PCB fabricators & OEMs who demand speed & technology.

The electronics industry is structured on high-performance, cross-functional teams across the entire supply chain.

Suppliers, distributors, fabricators, designers, and OEMs rely on the continual flow of new technology and the requisite materials to meet the demands of a wired and wireless world.

The Insulectro Team is committed to delivering the best materials possible, as quickly as possible, using the easiest process possible.

Patrick Redfern
PRESIDENT & CEO

TEAM MATTERS

We Enable Our Customers To Build Better Circuits, FASTER

EMC · ARLON · DUPONT · LCOA · CAC · PACOTHANE · INDUBOND · ORMET · DENKAI AMERICA · FOCUSTECH · JX METALS · TADCO · SHIKOKU · KYOCERA · IBC · SHUR-LOC · ETI

Denkai
FOILS

HIGH SPEED / LOW LOSS
- SEED
- HL
- EPS

CONVENTIONAL
- TOB-III
- MHT
- HP2

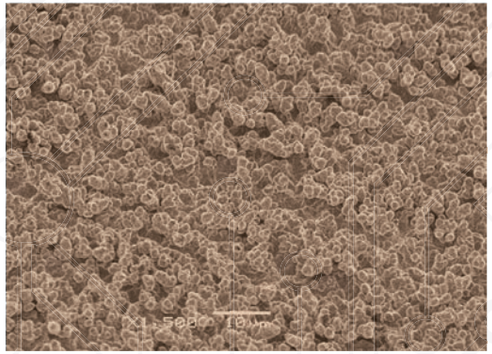
45TH ANNIVERSARY

Continuous Manufacturing in the U.S.

Electrodeposited Copper Foil

Denkai electrodeposited copper foil is recognized as a leader in reliability and technology leadership. With the strength of both domestic and international development and manufacturing, our goal is to solve the most challenging problems though collaboration and perseverance.

At Denkai America, copper foils are electroformed on revolving titanium drums, unique for the ability to deposit copper foils with a high-quality surface.



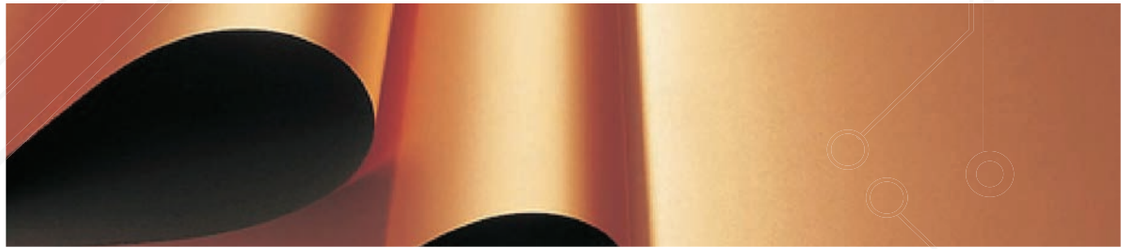
Electroformed foils are then subjected to a variety of surface treating operations contingent upon end-use requirements.

HIGH SPEED / LOW LOSS

SEED	High peel strength, very low provide – PTFE and Flex applications
HL	Next generation in low profile – high speed multilayer designs
EPS	"No profile" foil – signal critical layers on advanced thermoset resin systems

CONVENTIONAL FOILS

TOB-III	Standard and low profile options – for all modified epoxy resins
MHT	High lamination temperature compatible – PTFE and PI materials
HP2	Modified for improved bonding – designed for outer layer applications



COPPER FOILS

JX Metals

ELECTRODEPOSITED COPPER FOIL
TREATED ROLLED COPPER FOIL
JTCS-P1 ARSENIC-FREE VLP FOILS
JXEFL RTF VLP FOILS
HA-V2 VLP FOILS

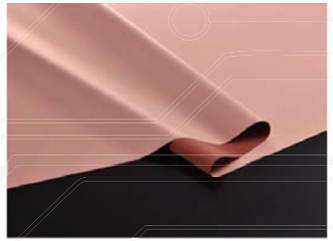
MITSUI KINZOKU

ELECTRODEPOSITED COPPER FOIL
MT18EX 18μm
MT18FL 18μm

COPPER FOILS

JX Metals

Low-Profile Electrodeposited Copper Foils



JX Nippon's electrodeposited foils have low-profiles to support fine line application.

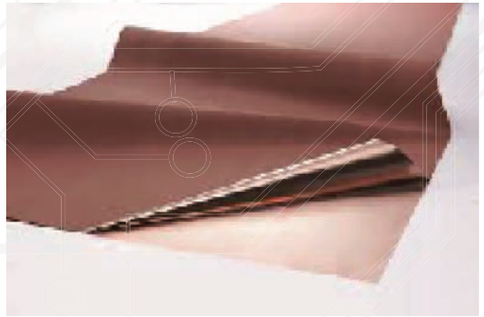
They can incorporate various surface treatment options, with fine nodulations and low surface roughness. Designed for high peel strength and excellent thermal resistance to support various dielectric materials.

JTCS-P1: High temperature elongation foil which is Arsenic free and reduced Zinc chemistry for design and manufacturing purposes. Applications include High Density Interconnects (HDI) boards, IC package substrates and Multi-layer printed circuit boards.

JXEFL: Annealable copper foil with high-elongation and class leading bendability available in various thicknesses and surface treatments. Applications include High Frequency designs, Flexible printed circuits.

MITSUI KINZOKU

Copper Foil - Electrodeposited



Mitsui Mining & Smelting offers electrodeposited copper foils for general purpose to high end design applications.

Their carrier foils known as MicroThin utilize an 18 μm carrier to support many market segments such as the Semiconductor Packaging and HD Interconnects. Which require suitable copper foils for fine circuit designs to achieve smaller and thinner devices.

These Grade 1 foils are suitable for fine pitch patterns with lines and spaces of less than 35 μm for manufacturing techniques such as mSAP.

GRADE 1 FOILS

MT18Ex 18μm carrier foil with a 3 μm or 5μm Electrodeposited foil, with a profile Rz of 2 μm regardless of thickness.

MT18FL 18μm carrier foil with a 1.5 μm Electrodeposited foil, with a profile Rz of 1.3 μm regardless of thickness.

FOCUStech™

PROCESS CHEMICALS
PROCESS CONTROL SYSTEMS
CUSTOM CHEMICALS FORMULATIONS
CUSTOM CONTROLLER DESIGNS
TECHNICAL SUPPORT
TOLL BLENDING

PROCESS CHEMICALS

The Best Teams have great chemistry.

We supply process chemicals and control solutions to printed circuit board fabrication and chemical milling operations. These chemicals are tailored to work effectively with DuPont and other dry film products. FOCUSTECH™ has a well-established stable of existing products but also prides itself in being able to quickly and effectively formulate custom products for customer specific applications. Insulectro and FOCUSTECH™ are your team for reliable, high quality process chemicals, control solutions and product support.

Process Chemicals

- Inner Layer PreClean Processes
- Develop-Etch-Resist Strip for IL Dry Film Processes
- Inner Layer Bonding Process
- Strip-Etch-Strip for OL Dry Film Processes
- Copper Microetches
- Cupric Chloride and Ferric Chloride Etching
- Antifoams
- Waste Treatment

Process Control Systems (In-house Design, Fabrication and Support)

- Developer
- Resist Stripper
- Tin Stripper
- Cupric and Ferric Etching
- Copper Cleaning & Etching
- Waste Treatment
- Custom Designs

DUPONT™
CHEMISTRY

HDI:
Microfill™ EVF-III
Microfill™ LVF-IV

MLB:
Copper Gleam™ PPR-II
Electroposit™ EP-1600
Copper Gleam™ HS-200
Copper Gleam™ ST-920

IC PACKAGE SUBSTRATE
Microfill™ SFP-II
Microfill™ LVF-IV

ELECTROLESS COPPER SOLUTIONS
Circuposit™ 3350-1
Circuposit™ 4000
Circuposit™ 6700

DIRECT METALLIZATION SOLUTIONS:
Crimson™
Conductron™

ENIG:
Duraposit™ SMT-88
Aurolectroless™ SMT 520

PROCESS CHEMISTRIES
GENERAL METAL FINISHING

CHEMISTRY

Innovative metallization technologies across many platforms

The addition of the DuPont Electronics Imaging & Interconnect Solutions (ICS) chemistry line, which includes former legacy Dow chemicals, adds a complimentary piece to an already robust Insulectro product offering in chemistry.

This addition now provides chemistry and technical support to the general metal finishing, plating-on-plastics, and wire-plating industries - a symbol of our commitment to chemistry.

We deliver tutorial programs to engineering, quality, and production teams both at customer sites as well as virtually. These collaborative engagements are tailored specific to the application and the audience, including both well-established DuPont chemistry processes and new technologies being developed and introduced into the North American market.

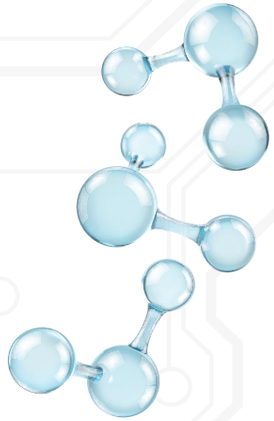
DISCOVER DUPONT CHEMISTRY

ELECTROPLATING APPLICATIONS

HDI
Microfill™ EVF-III for advanced via filling and through-hole plating
Microfill™ LVF-IV for next generation SLP applications

MLB
Copper Gleam™ PPR-II for high aspect ratio pulse plating
Electroposit™ EP-1600 for high aspect ratio DC plating
Copper Gleam™ HS-200 for horizontal DC plating in FPC applications
Copper Gleam™ ST-920 for DC vertical continuous plating (VCP)

IC Package Substrate
Microfill™ SFP-II & Microfill™ LVF-IV for advanced SAP applications



MAKING HOLES CONDUCTIVE

Electroless Copper Solutions
Circuposit™ 3350-1 Vertical Electroless Copper
Circuposit™ 4000 Horizontal electroless copper for FPC/RFPC
Circuposit™ 6700 Horizontal Ionic Catalyst for Advanced HDI applications

Direct Metallization Solutions
Next Generation Crimson™ & Conductron™ palladium-based systems
Next Generation Graphite 2000™ carbon-based system

ENIG
Duraposit™ SMT-88 & Aurolectroless™ SMT 520

Process Chemistries
DuPont offers a full line of cleaners, developers, strippers and other ancillary products to support printed circuit applications.

General Metal Finishing
Full line engineering, decorative and precious metal offerings

SHIKOKU

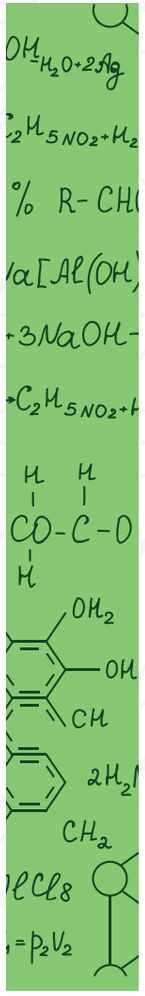
GLICOAT-SMD F2(LX)
GLIBRITE GB-4300
GLICAP

OSP & ADVANCED PRETREATMENTS

Trailblazing technology

Shikoku Chemicals Corporation manufactures and sells chemical products and housing materials in Japan and internationally. Its product portfolio includes inorganic chemicals, organic chemicals, advanced and specialty chemicals, electronic chemicals comprising organic solderability preservative and microetching solutions, and advanced and specialty chemicals.

OSP (Organic Solderability Preservative) is the most popular final surface finish for PCBs. OSP film has excellent humidity resistance to protect copper oxidation.



Organic Solderability Preservatives

WHY OSP:

- OSP process is lower cost than HASL and the other metal finishes
- OSP process is environmentally friendly (VOC free, etc.)
- OSP film is available for lead free solder application
- Good solder joint strength compared to Ni/Au plating

Glicoat-SMD F2(LX)

For lead free solder and selective gold.

Good performance on the selective gold boards, due to no deposit of OSP film on gold pads. It is very suitable for mobile phone, memory boards

.

Advanced Pretreatments

Glibrite GB-4300

Gilbrite GB-4300 is a sulfuric-peroxide copper roughening solution to promote adhesion of Dry film and solder mask resists.

An economical and environmentally-friendly solution due to low and consistent etching chemistry providing excellent adhesion as compared to conventional microetch processes.

Advantages:

- Excellent adhesion with less etching (10-15 min)
- Suitable for super fine copper circuit and higher signal integrity, due to lower roughness
- Good stability in high copper concentration achieves lower running cost
- Uniform appearance with typical Etching amount 0.2 - 0.6 μm

GliCap

Newly developed non-etch adhesion promoter composed of azole derivative, which Shikoku has expertise from synthesizing for their OSP product.

Advantages:

- Very thin organic film deposited only on copper surface via vertical/horizontal wet process line
- No etching/change in topography of copper surface, beneficial for high frequency applications
- Strong chemical bonding between copper and resin
- No additional special copper surface preparation such as Tin
- Compatibility with wide range of resin systems

InduBond® TECHNOLOGIES

X-PRESS
for Lamination

RFX
for Registration

230N
for Bonding

LAMINATION, REGISTRATION, & AUTOMATION

Induction bonding technology. A better way. . . Finally.

InduBond® has long been respected for tight accuracy in registration, its lamination presses, automation (automatic loading/unloading), and its eco-friendly best practices.

InduBond® X-PRESS lamination presses utilize a different way of producing the heat required for lamination using standard pressing methods.

The innovation of this technology is that it produces heat on the laminated material, and only the laminated material, of each layer of the press pack at the same time, at the same temperature level, without any thermal conduction.

X-PRESS - Inductive heating is the revolutionary new way of PCB laminates

RFX - High-precision (<10 microns) layer-to-layer registration

230N - Next-generation inductive bonding machine

MEET INDUBOND®

InduBond® TECHNOLOGIES

EMD ELECTRONICS

ORMET® SINTERING PASTE

CONDUCTIVE PASTE

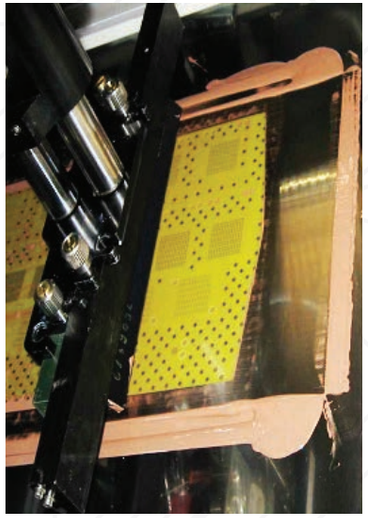
ORMET® SINTERING PASTE

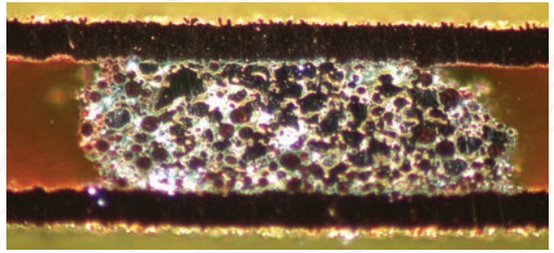
Paste Don't Plate

A solid, intermetallic bond

Use Ormet® Sintering Paste in PCBs to form High Density Interconnects in a fraction of the time it takes to plate.

Ormet® pastes make cycle time reduction and high-end performances possible in any PCB shop.





Ormet® pastes are lead-free, highly electrically and thermally conductive, and provide good solderability at relatively low temperatures. During the curing process, the material forms a solid metal, alloying with the copper circuits in the Z-axis. This forms a metallurgical bond stronger than mere contact. Once completed, the sintered metal will not re-flow until temperatures of 800°F.

High Density Interconnects (HDI) in PCBs have traditionally been made using electroplating. However, advanced requirements in ball grid array density, high PCB layer counts, and fine diameter vias have created the need for paste solutions. Because the PCB layers connected by paste may be tested individually, as opposed to the sequential electroplating process that can only be tested in its final form, overall yields are significantly improved. Also, the Ormet® process requires a substantially lower capital investment than expensive plating lines and water treatment facilities and is much more environmentally friendly.

Imagine how fast you could make your boards if you didn't have to plate.

PASTE DON'T PLATE™

Design Education

INSULECTRO

MATERIAL RECOMMENDATIONS

SPEEDY REGIONAL MATERIAL AVAILABILITY

STACK-UP SUGGESTIONS: HDI, RF, FLEX, RIGID-FLEX, SI & DFX

DESIGN REVIEWS

MANUFACTURING INTERFACE

DESIGN LAYOUT OUTSOURCE

PCB DESIGN EDUCATION

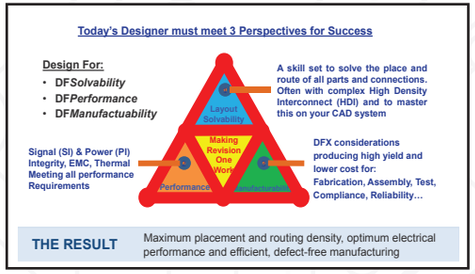
Let Insulectro Assist Your Design Efforts

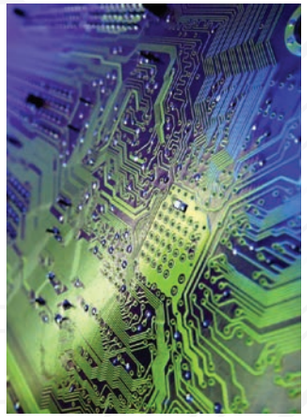
With its unmatched reputation for supplying PCB manufacturers Best-in-Class materials from World-Class Suppliers, Insulectro again innovates with another breakthrough offering – Design Education Services.

Recognizing the need for exacting PCB and PE design, Insulectro offers its fabricator and OEM customers design audits and guidance.

Paired with new, vibrant Educational Service offerings, Insulectro ensures that game-changing materials match-up with your optimized designs.

Insulectro's industry experience generates credibility for design expertise. By streamlining the process and utilizing our industry knowledge of materials and fabrication, customers can bring their boards to market faster and more cost effectively.





Correct Material Selection & Utilization

DFS – Design for Solvability
HDI Routing & Packaging

DFP – Design for Performance
Signal Integrity HSD, RF & PDN

DFM – Design for Manufacturability
Material, Feature Size, & Process

Why Materials Are Important

Availability

- PumaFAST™ - Off the shelf materials
- Shorter lead times
- Select industry standard constructions

Manufacturability

- Process friendly
- Isola materials process similarly to FR4
- Lower cost of manufacturing
- High range of technical performance

Technical Support

- FAEs located throughout the country
- Optimize Technical Performance
- Design and Education support

INDUSTRIAL BRUSH CORP.

PUMICE SCRUBBING BRUSHES
DEBURRING BRUSHES
CLEANING BRUSHES

BRUSHES

Over 100 years of brush design and manufacture

Industrial Brush Corporation (IBC) has roots that can be traced back to 1896. Circuit board brushes feature aluminum construction for maximum durability without excess weight. The spiral-wound design permanently locks brush filaments into a channel to prevent filament loss. Brushes are precision trimmed to maintain uniform surface finishes. To meet the increasing surface preparation requirements of the PCB industry, IBC offers the complete range of impregnated nylon filament in grit sizes from 180 to 500.

Bristle for Deburring: Brushes with grits of 180, 240 and 320 quickly and effectively remove drilled hole burrs. The self-cleaning action of these brushes preserves the integrity of the hole.

Bristle for Scrubbing: Brushes with grits of 320, 500 and 600 are ideal for heavy scrubbing and cleaning. Typical applications include copper scrubbing, tin lead cleaning, oxidation removal, and surface preparation for resist adhesion.

Light-Duty Cleaning Non-abrasive nylon filament brushes are available for light-duty or final cleaning.

GIVE YOUR PROBLEMS THE BRUSH-OFF

Our Service Program can tie in brush changes for proper preventative maintenance.

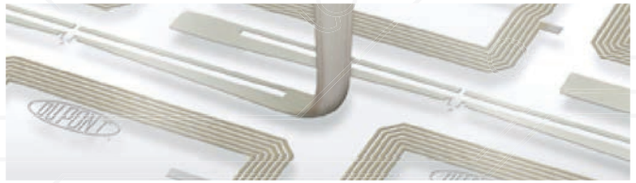
INSULECTRO

PRINTED ELECTRONICS

CONDUCTIVE INKS
ADVANCED SUBSTRATES
CONVERTING & TOLLING SERVICES
TECHNICAL SERVICES

for:
MEMBRANE SWITCH
WEARABLE ELECTRONICS
CAPACITIVE SWITCH
TOUCH SCREEN
CONTROL PANELS
BIOMEDICAL SENSORS
FORCE-SENSING RESISTORS
IN-MOLD ELECTRONICS
PTC HEATERS
PCB
WIRE WRAPPING
RELEASE LINERS
ANTENNAS
BATTERIES/EVs

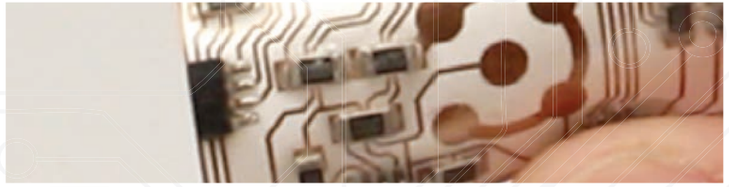
PRINTED ELECTRONICS



One Stop Shop For Printed Electronics

The dynamics of Printed Electronics is changing. Keeping up is a full-time job. Count on Insulectro to keep you current with cutting-edge technologies and our one-stop-shop of innovative materials from best-in-class suppliers.

These products, and our unparalleled technical support and customer service, assure our customers that Insulectro is watching out for your needs.



Printed Electronics Markets

More and more disparate markets are relying on printed electronics for thinness, reliability, and ease of manufacture.

Printed electronics offer designers a wide variety of options and attractive economics, helping to put electronics everywhere.

Insulectro is committed to help pioneer this new frontier of future circuits.

KEY SUPPLIERS

Celanese, MICROMAX, coveme, 3M, Kodak, FLEXcon, SAINT-GOBAIN, DUPONT, Chemours, PACOTHANE TECHNOLOGIES, TCI

TADCO

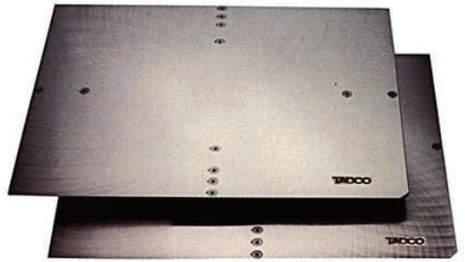
LAMINATION PLATES
PRECISION PIN & BUSHING
HIGH PERFORMANCE RELEASE AGENT
PIN CLEANER, BUSHING BRUSHES, AND INSPECTION TOOL

PRECISION LAMINATION TOOLS

Finest Tooling for Lamination Available

TADCO's strict adherence to quality standards and exclusive use of custom alloys makes a world of difference when producing tough multilayer PCBs. Every order of tooling plates comes with a coordinate Measuring Machine Report and Certificate of Compliance traceable to MIL standards.

In addition, TADCO can manufacture Lamination and Transport Plates for any press system; both manual and automatic load and unload. TADCO's specialized knowledge of the PCB lamination processes as well as metallurgical and heat treating sciences combined with highly graded steel alloys allows us to produce the finest tooling available today.



TOOLING & SEPARATOR PLATES

ACCESSORIES

Precision Pin & Bushing for higher registration

High performance release agent for eliminating resin residue

Pin cleaner, Bushing brushes, and inspection tool

EQUIPMENT SERVICE

REBUILDS & INSTALLATIONS

With 20 years of experience, we take machine rebuilds seriously!

The calls for Preventative Maintenance Programs and Equipment Rebuilds are increasing as customers understand the benefits this brings to their equipment's overall performance and up time.

Many of you are excited to hear we can help fill this gap in Technical Support.

It is sometimes difficult to see a machine's degradation over time and it's lack in performance can result in product/process issues that can be difficult to identify.

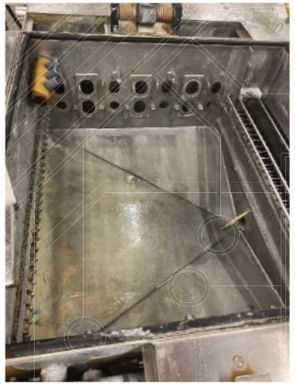
We can provide the following services to ensure your equipment is running at its optimal level. Result: more equipment up time.

We can assist in your equipment needs through the following:

- **Equipment Reviews and Audits**
- **Service and support**
- **Preventative Maintenance Programs**

Also, do you have a used piece of equipment you're looking to get installed? We may be able to assist here as well!

PREVENTIVE MAINTENANCE PROGRAM



Breathing New Life into Worn Machines

SHUR-LOC® E-Z XL STRETCHER

SHUR-LOC® E-Z 2.0 SERIES FRAMES

SHUR-LOC® E-Z 2.0FABRIC PANELS

SCREEN TENSION SYSTEM

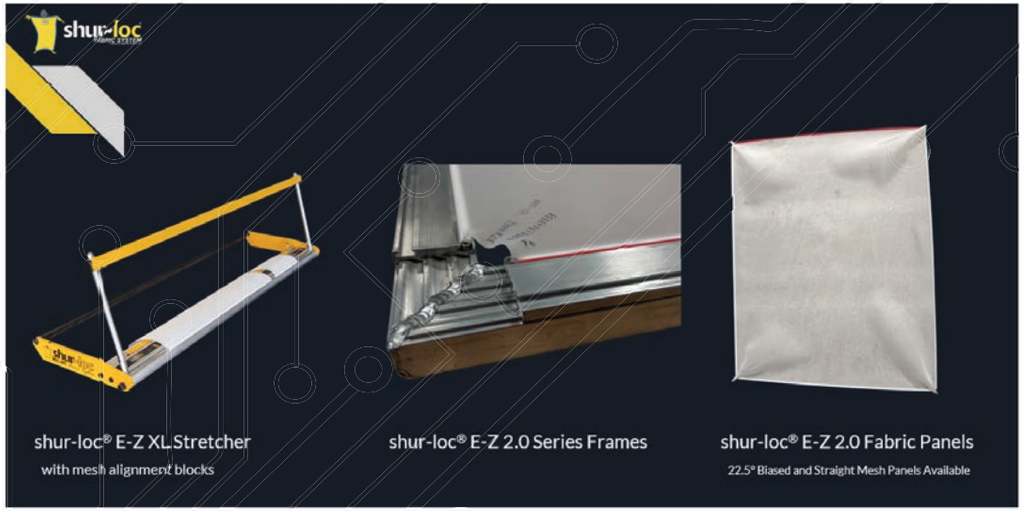
When it comes to screen tension, it can't be too much or too little

When it comes to screen tension…..too little is not good and too much is not good either! Through extensive testing, shur-loc® has mastered the optimal tension when screening soldermask on automatic screen printers.

Too little of mesh tension will allow the mesh to move under the squeegee causing soldermask to flow into the holes. It will also cause the mesh to retract very slowly off the surface of the panel.

Too much tension could cause the squeegee to flex during printing and leave a heavier deposit on the outside edges of the panel. Not to mention the extra mechanical stress needed from the machines mechanical system.

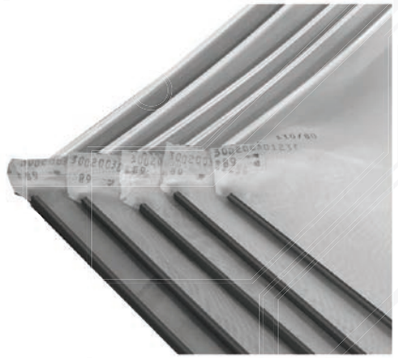
shur-loc® and experienced screening department supervisors have pinpointed the optimal tension so you get the best performance across the board.



A SCREEN SYSTEM THAT WORKS

The shur-loc® Difference

- Mesh panels that are ready to stretch into the Shur-loc frame in minutes
- Each mesh panel has a color-coded edge as well as the information stamped in one corner
- Available in the common 22.5 degree angle needed for LPI or 90 degree



shur-loc® can custom fit all most any size frame to your application

- Ease of use, anyone can learn to stretch a frame
- Continuous consistent tension throughout the frame
- Frames can be stretched in a matter of minutes
- Ready for immediate use. No more leaving frames/mesh to settle out for hours and then having to retension before use