

Polyclad Introduces Polyimide Laminate and Prepreg Systems

Polyclad Laminates, Inc., a Cookson Electronics PWB Materials & Chemistry business, has introduced a new line of polyimide copper-clad laminates and prepregs. Based on bismaleimide (BMI) type resin, the systems are specially engineered for use in rigid, high temperature PWB applications used in military, aerospace, avionics, burn-in, oil drilling and other demanding electronics market segments. The pure polyimide materials contain no blended or "co-polymer" chemistry and are ideally suited to provide optimum reliability and extended performance in extreme operating environments, including hostile PWB assembly procedures.

Available as Polyclad® GI-785 (non-flame retardant) and Polyclad GI-787 (UL V-1 flame resistant), the laminate and prepreg systems exhibit high glass transition temperatures (Tg) of 260 oC for maximum thermal performance and low Z-Axis CTE to ensure electrical integrity. Product surface quality is unmatched in the industry due to the exclusive use of CAC; Class C standard that eliminates potential problems associated with resin spots or other surface defects. Superior laminate multi-ply, balanced laminate constructions contain premium glass fabrics and a low resin content to minimize curl or warp while optimizing dimensional stability (DS). Consistent prepreg performance is achieved through advanced melt viscosity testing.

Engineered to the most stringent manufacturing standards, Polyclad GI-785 and Polyclad GI-787 systems are non-MDA curing and meet OSHA 1910.1050 requirements. Copper bond peel strengths are equivalent to FR-4 materials using special profile foils.

Upon final UL certification as ANSI Type GPY, the systems will be listed as PCL-GI-785 laminate / PCL-GIP-785 prepreg and PCL-GI-787 laminate / PCL-GIP-787 prepreg. All materials meet 4101A, -40 and -41 requirements and are compatible with all commonly used polyimide process techniques.

Polyclad Laminates, Inc., is a business of Cookson Electronics PWB Materials & Chemistry. The company is one of the world's

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leading manufacturers of laminates, prepregs and resin coated copper foils used in printed wiring boards. The group also includes Enthone Inc., a leading supplier of high performance specialty chemicals and coatings used in the electronics and surface finishing industries.

IPC Honors Best Technical Paper at 2002 IPC Annual Meeting

NORTHBROOK, Ill., November 13, 2002--IPC—Association Connecting Electronics Industries—has announced the winner of the Best Technical Paper Award at the 2002 IPC Annual Meeting, which took place Nov. 3-7 in New Orleans, La.

Steven Dunford, Nokia Mobile Phones; Dr. Anthony Primavera, Universal Instruments Corporation; and Michael Meilunas, Universal Instruments Corporation, received the Best

Technical Paper Award for their paper entitled "Microstructural Evolution and Damage Mechanisms in Pb-Free Solder Joints During Extended -40 °C to 125 °C Thermal Cycles." The paper was chosen based on its timely insight into the effects of long-term thermal mechanical stresses and the attendant failure mechanisms in Pb-free solder interconnections.

IPC awarded the recipients with a commemorative plaque at a luncheon award ceremony on Wednesday, Nov. 6.

For more information on the authors or their winning paper, contact John Perry, IPC technical project manager, at JohnPerry@ipc.org or 847-790-5318.



High Performance Attributes Of Linear Motors Spur Enhanced Customer Demand

The emergent European linear motors sector counts among the most dynamic in the motion control industry. Rising user awareness and application penetration allied with high performance standards are ushering the market on the route to robust, sustained growth. This is reflected in the projected doubling of revenues and the quadrupling of unit sales between 2001 and 2008.

Across a range of application areas, linear motors tend to be more reliable and require less regular maintenance than mechanical systems. Lower maintenance needs are translating into higher levels of efficiency and savings due to reduced downtime. Consequently, original equipment manufacturers (OEMs) are increasingly looking to incorporate linear motors into a wide range of applications.

Mechanical systems can lag behind linear motor specifications, thereby creating a new customer base of machine builders for linear motor manufacturers. In particular, OEMs are excited about the high speed and precision standards provided by linear motor solutions.

„The use of linear motors has been increasing, with growth partially attributed to machine requirements driving the need for more precise movements at higher speeds. With more advances expected over the coming years, replacement of traditional components to gain high machine specification is expected to continue to drive future growth,“ notes a new study by Frost & Sullivan (<http://motors.frost.com>), the international marketing consulting company.

Industry Analyst Sean French says: „Superior acceleration and control attributes, in particular, are expected to drive a substantial

need for high specification devices. Other promising technological advances such as the emergence of tubular motors is further expected to widen the application base and drive demand.‰

In a price-sensitive market, customer uptake of linear motors has been dampened due to its high costs. However, the anticipated fall in prices due to rising volumes is expected to stimulate demand. The projected decline in prices coupled with the benefits of linear motors is expected to boost penetration, revenues, and unit sales.

High rates of investment have also played their part in converting linear motors from a niche to a more mainstream technology. Larger organisations have acquired and invested in smaller manufacturers of linear motors.. Investments pouring in from all areas of the European linear motors market have contributed to advances in both product and manufacturing

processes. This, in turn, has supported reduced product prices and increased customer uptake.

Low levels of customer awareness have been a major challenge to potential market expansion. „However, the advancing use of linear motors in a wide range of applications has raised their profile over the last few years. Moreover, positive feedback from new end-users has enhanced the reputation of linear motors, thereby encouraging the prospect of strong future sales,“ notes Mr French.

A larger, expanding customer base is expected to underline the widening applications, volumes, and revenues of linear motor solutions. Accordingly, the total market is expected to increase from \$57.0 million to \$125.0 million by 2008. Unit shipments are forecast to enjoy even stronger growth, soaring from 33,300 to 125,500 units between 2001 and 2008. The largest contributor to market

revenues, in the long term, is expected to be the machine tools application segment. By 2008, this sector is expected to surge ahead of the semiconductors sector as the largest application market for linear motors, accounting for 24 per cent of revenue shares.

A positive increase between current and future revenue contribution is anticipated to derive from the others segment consisting of applications such as medical, military, and rides at theme parks. Here, new and emerging areas of deployment are likely to stimulate above average market growth rates and demand.

The relatively well established semiconductors and electronics sectors were the first and second largest application sectors for revenues in the European linear motors market in 2001. While still significant, their revenue shares are likely to fall as emergent application segments experience higher rates of growth. A similar

trend is also expected to be observed in general handling, which is forecast to remain both the smallest application segment and revenue contributor.

As a substantial base of potential customers in Europe becomes acquainted with, and increasingly installs linear motor technologies, growth will benefit. Germany will remain at the forefront of demand even though its revenue share is likely to decline as other regions grow at a faster rate. Italy, the Benelux countries, and Switzerland are already significant users of linear motors and demonstrate strong growth potential.

With this lucrative market poised for take off, competitive pressures are intensifying. Both large companies with a broad product range and small businesses with dedicated product offerings are in the fray. Siemens is perched at the number one position with its specialist linear motors division producing technology primarily for the machine tools sector.

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SIKAMA OFFERS WAFER HANDLING SYSTEM FALCON WHS 412

Sikama International Inc. of Santa Barbara, CA is proud to announce the release of their latest tool, the FALCON WHS 412 WAFER HANDLING SYSTEM. The FALCON WHS 412 functions include: wafer loading, wafer unloading, multiple cassette wafer loading (up to 4 cassettes), wafer wash/coat return, and wafer cassette to cassette sorting.

The WHS 412 can be integrated with Sikama Reflow Ovens and Flux Coaters/Washers as part of a total wafer bump solution or with other manufacturers tools. Utilizing a cylindrical 4-axis robot design, the WHS 412 is capable of handling 4 inch – 12 inch wafers with no re-teaching required. It is fully programmable to create recipes for wafer size, mode type,

run speed, and repeat function. It features built in software teaching tools for wafer place, wafer pick-up, go to slot, pitch offset, and jog. The WHS 412 comes standard with automatic cassette size detection. Diagnostics mode allows visual maintenance of all inputs, outputs, servomotors, and encoders. Normal mode allows direct and immediate process changes in real time. Password protection allows multiple level operator use. System requirements include electrical power and vacuum.

Permalı Approves Smart Sonic for Durostone Pallet Cleaning

Permalı Composites S.A., manufacturer of Durostone, pallet materials has approved Smart Sonic, Ultrasonic Stencil Cleaners and 440-R, SMT Detergent for cleaning flux residues from reflow and wave solder pallets. Kenny Munro, Product Manager

for Durostone solder pallet materials, explains:

It was previously advised not to clean Durostone solder pallets using ultrasonic equipment as it seriously degraded the material and left it susceptible to flux attack, reducing the life-span of the pallets. Two cases had been reported but a manufacturer supplying the PCB industry did not produce the ultrasonic machines used in both instances.

As many end-users were having problems with cleaning and did not have a budget to invest in a dedicated system just for pallets, enquiries were received from customers if they could use the ultrasonic stencil / pallet cleaners available for this purpose.

Tests were carried out in conjunction with a major ultrasonic cleaner manufacturer, Smart Sonic Corporation of Canoga Park, California, U.S.A. A batch of pallets covered in a non-clean flux were submitted to Smart Sonic for cleaning and

returned to the customers' production line. Following cleaning of the pallets, no degradation occurred so it was concluded that given the correct equipment and process settings, ultrasonics does not affect Durostone.

It was finally concluded that the past problems occurred due to the material being subjected to a low frequency, i.e. below 40kHz. The lower the frequency the more aggressive the ultrasonic cavitation.

Ultrasonic cleaning can be compared to manual cleaning.
- Using high frequency / low power ultrasonics is like using a soft brush with little scrubbing force.

- Using low frequency / high power ultrasonics is like using a stiff wire brush with lots of scrubbing force.

DO NOT CLEAN DUROSTONE USING A LOW FREQUENCY SYSTEM (below 40kHz)

However, when employing high frequency / low power ultrasonics, an effective cleaning chemistry must be used to break down the flux contaminants on the pallets. The tests at Smart Sonic were successful using their 440-R SMT Detergent.



DEK delivers first production mass imaging technology for 300mm wafers

DEK has successfully deployed a production wafer bumping solution for 300mm wafers at customer sites in Asia. The

system has been developed using DEK's mass imaging technology for back end wafer processing and wafer handling technology developed by Adept Semiconductor Handling Division of Livermore, California in conjunction with DEK

The new system builds on DEK's existing back end solutions for 150mm and 200mm wafers, and is capable of transferring 300mm wafers from open cassettes or FOUP's into the processing station, and of automatically returning them to the cassette or FOUP or directly to reflow oven when processing is complete. Wafers are transported by a conveyor, which is integrated with the system via standard, SMEMA-compliant interfaces.

"This is a real, production system that is in action today, processing our customer's 300mm wafers and delivering excellent results," said Neil MacRaild, manager of DEK's Semiconductor Packaging Technologies Group. "This is important news as commercial

electronic manufacturers move toward volume production of high performance chip scale packages."

DEK's back end processing solutions for 150mm and 200mm wafers are already in operation at customer sites throughout Europe, the USA and Asia. These successful processes, including DirEkt Ball Attach(tm) solder ball placement, and fine-pitch bumping by paste deposition, are based on DEK's patented ProFlow® DirEkt Imaging technology that enables precision control of electronic materials for deposition onto wafers and other substrates such as FR4 epoxy. These include solder balls down to 0.3mm, solder pastes including low-alpha pastes, encapsulants and other materials required by advanced semiconductor packaging.

By reducing the capital cost of clean room space of back end wafer level processes, while enhancing equipment flexibility and first pass yield, DEK's

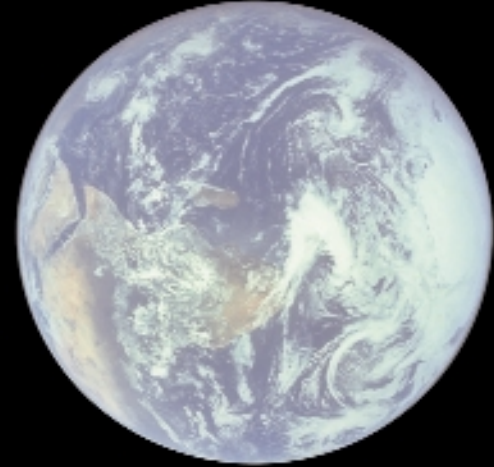
packaging technologies allow advanced wafer level CSPs and other chip scale package styles to be applied to a wide range of commercial component types.

Special connector provides signal processing solution

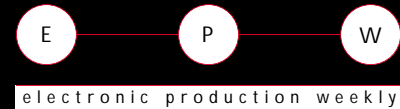
Connector specialist ODU recently developed an interconnect solution for an international blue-chip company to transmit signal and high frequency data from the front panel of a testing device to its motherboard.

The system uses a the ODU Mini-Snap push-pull connector on the front panel for the high frequency signals, up to 200 MHz, and the company's Mini-Fix card-to-cable connectors to interface with the motherboard. During development it was established that the Mini-Fix connector could transmit the high frequency signals with acceptable values for cross talk and attenuation. Moreover Mini-Fix is now even

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used in base station applications at frequencies up to 1 GHz.

A major benefit is that the expensive semi-rigid coaxial cables previously used can be replaced by the cost-effective Mini-Fix. Also, not only can high frequency and signal connections can be run in parallel but the connector system can also be supplied with sufficient terminations for grounding.

Mini-Fix is a 1.27 x 2.54 mm IDC connector available in 10 to 50 ways. It can be connected to the PCB by a pin/ socket combination or direct connection by soldering, and headers can be processed on the PCB by wave soldering, surface mount technology and pin-in-paste.

FeinFocus Introduces Image-enhancing Collimator Add-on For Its X-ray Tubes

FeinFocus introduces the availability of the new collimator add-on for its X-ray tubes,

designed to enhance overall image quality.

The new collimator is designed to limit the cone angle of X-rays transmitted from the source to a maximum of 40 degrees, significantly reducing the amount of stray radiation that normally escapes from the intended conical path, resulting in a cleaner, crisper image with greater contrast. This accessory is ideal for applications with very small, dense, or micro-mechanical components. Additionally, the collimator also decreases the sample's exposure to the X-ray radiation, especially beneficial for applications with highly sensitive components.

The collimator is threaded for easy installation eliminating the need for any additional tools and is currently available as an accessory for all FeinFocus transmission X-ray tubes. For more information, visit www.feinfocus.com or call (203) 969-2161.

Doug McKay Joins TRI-C

Design as Automation Specialist

TRI-C Design, Inc. (tricdesign.com) is pleased to announce that Doug McKay has joined the company as an Automation Specialist. McKay will help lead the introduction of TRI-C Design's new Automation Services, which automates the flexible circuit and printed circuit board (PCB) tooling process.

McKay brings more than 20 years of industry experience to TRI-C Design, having most recently worked as a senior applications engineer for Orbotech, Inc., a worldwide high-tech equipment company that serves the PCB industry. There, he developed automation for Genesis 2000 software. He is one of the industry's leading experts on the automation of Genesis software, having worked with Genesis for more than seven years.

In addition to Orbotech, McKay has worked as an applications engineer for Valor Computerized

Systems, Avar Integrated Solutions, Infinite Graphics Inc, Cybolic Sciences Inc. and Excellon Photonics.

"Doug is a great addition to the TRI-C Design automation team," said Keith Hildahl, president of TRI-C Design. " He has worked with most of the world's leading suppliers to the PCB industry and he has a clear understanding of the importance of TRI-C's new Automation Services for circuit manufacturers who are feeling pressured by global competition." McKay believes that TRI-C Design



provides an opportunity for him to contribute to industry innovation. "I'm excited to be part of a company that has the capacity to significantly help circuit manufacturers improve their business," said McKay.

TRI-C Design's New 'Automation Services' Streamlines PCB and Flex Circuit Tooling

New capability is like having a programmer in-house

NORTHFIELD, Minn. – July 22, 2002 – Answering the electronic manufacturing industry's need for fast-turn, accurate tooling, TRI-C Design, Inc. (tricdesign.com) is introducing software services to automate the flexible circuit and printed circuit board (PCB) tooling process. Called, Automation Services, it streamlines Infinite Graphics' ParCAM/ProFLEX, Frontline's Genesis 2000 and other major computer aided manufacturing (CAM) software products. TRI-C Design's Automation

Services take automation to the next level, programming specific needs into the tooling process to free CAM professionals from redundant tasks. The cost savings from reducing front-end CAM work can be significant over time, and source code in standard programming and scripting languages allows the software to be maintained in-house.

"Global competition in volume manufacturing has forced United States circuit manufacturers to change their business model to quick-turn, low volume manufacturing. This change in business requires fast, accurate tooling that can only be provided through automation," said TRI-C president Keith Hildahl. "There are many CAM products on the market that work right off the shelf. But real productivity is only gained through use of automation."

Automation Services benefits include:

- Higher quality tooling – provides consistent tooling to the

production floor and eliminates errors caused by manual interaction.

- Faster turnaround – reduces wait times caused by manual interaction and eliminates re-entry of information.

- Cost savings – reduces expenses in training of new CAM professionals. Allows reassignment of CAM professionals in areas that require human thought and reasoning, while eliminating costly production scrap due to tooling errors.

TRI-C Design's automation team is uniquely qualified to automate the tooling process for both hardboard and flex circuit manufacturers. The team is led by Dave Roesler, TRI-C Design business development manager, and Doug McKay TRI-C Design automation specialist.

Roesler is one of the industries' foremost authorities on Infinite Graphics' software. His 20 years

of programming experience includes 14 years managing software development for Infinite Graphics, Inc.

McKay has more than 20 years' experience in the industry, including seven years working with Genesis software. He has been an applications engineer for some of the largest suppliers to the PCB industry: Orobtech, Inc.; Valor Computerized Systems; Infinite Graphics Inc.; Cymbolic Sciences; and Excellon Photonics.

"TRI-C's Automation Services is essentially like having an experienced programmer on your staff," said Hildahl. "We are convinced the addition of this capability will help many circuit manufacturers to stay competitive in today's demanding marketplace."

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PHASED REFLOW ANTI-TOMBSTONING SOLDER PASTE FOR HIGH SPEED PRINTING PROCESSES

Henkel Loctite Corporation has introduced new Loctite(R) Multicore(R) 63S4 MP200 no-clean solder paste, formulated with the unique 63S4 alloy that eliminates costly tombstone defects and reduces components misalignment that occurs when reflowing boards with very small components such as 0402 and 0201 chips. This paste offers excellent performance on difficult to solder substrates.

Suitable for fine pitch, high speed printing applications, Multicore 63S4 MP200 is a drop in replacement for standard lead alloys, but offers a wider process window to compensate for inaccuracies in screen printing, pick-and-place, and thermal profiling. The paste is formulated to deliver extended abandon time, long open time, slump resistance and increased tack life. The product is suitable for use on a variety of substrates including

HASL, OSP copper, gold over nickel, and silver immersion.

The Loctite Multicore 63S4 alloy blends SN63 and SN62 with melting points of 183°C and 179°C respectively. In a phased reflow process, a small amount of SN62 wets both sides of the termination before the SN63 melts, tack soldering components to the PCB and delivering a larger assembly process window. By eliminating tombstone defects, 63S4 MP200 solder paste increases production yield, decreases rework costs, and improves overall quality.

This paste meets or exceeds test specifications of J-STD-004 for copper mirror, copper plate, chlorides and bromides, and is classified as ROL0. Multicore 63S4 MP200 also meets Bellcore GR-78-Core standards for electromigration. For more information on Loctite(R) Multicore(R) 63S4 MP200, call (626) 968-6511 or visit the Loctite Web site at www.loctite.com/electronics.



Gedas Iberia to Implement Tecnomatix Manufacturing Process Management Solutions in Automotive Manufacturing Operations

Spanish Systems Integrator to Use eMPower Solutions in its SEAT, VW-Navarra and Autoeuropa Engagements

NASHUA, N.H.--Nov. 19, 2002--Tecnomatix Technologies, Ltd. (NASDAQ: TCNO), the driving force in Manufacturing Process Management (MPM) solutions, today announced a series of

agreements with gedas Iberia - valued at approximately US\$350,000 -that will benefit automobile production at SEAT, VW-Navarra and Autoeuropa. gedas Iberia plans and implements all IT-related projects at the three manufacturers. gedas will use several products from the Tecnomatix eMPower(TM) MPM solution set to help these companies lower production costs, maintain high quality, reduce risk and help bring products to market faster.

Tecnomatix eMPower products to be used at these engagements include eM-Workplace, eM-Spot, eM-Paint, eM-Human, eM-Assembler and eM-Plant. As part of the agreements, Tecnomatix will also provide gedas with training, support and integration assistance. The solutions will be used in both the pre-planning stage (body-in-white processes) and the detailed studies stage.

During pre-planning, these eMPower solutions will be used in feasibility and reachability studies

(assembly process validation) and to provide feedback to product design, help with assembly sequence definition and estimate costs. During detailed studies, the eMPower solutions will provide complete painting, welding line and workcell studies with paths, fixture definitions and offline programming. It will also provide plant layout definitions, work instruction development, and path optimization.