



March, 2006 Issue

## Contract Manufacturing



### Doing It All at Endicott Interconnect Technologies

*By Theresa Taro, Director of  
Marketing and Communications,  
Endicott Interconnect Technologies,  
Inc., Endicott, NY*

When IBM decided to sell its organic microelectronics business in 2002, the result was spin-off company Endicott Interconnect Technologies, Inc., (EI) headquartered in Endicott, NY. Today, this company is not just a contract manufacturer, it is a leading supplier of advanced semiconductor packaging, printed circuit boards, precision equipment manufacturing and technical services, as well as electronic manufacturing services. In addition to the electronics business, EI acquired IBM's sprawling campus consisting of 4.1 million square feet in Endicott, the city where IBM had been born. And like IBM, the company emphasizes in-house R&D, a characteristic not usually associated with contract manufacturers. At the helm of the privately-held EI is James J. McNamara, former Tyco Electronics executive. His staff is a blend of seasoned IBM veterans and experienced professionals from within the electronics industry. Together, Mr. McNamara and his staff are forging a new path with exciting growth opportunities that will lay the foundation for the future of advanced packaging at Endicott. This is an ambitious task and there have been obstacles to overcome as the company takes steps to become a merchant provider and to successfully adapt in an intensely competitive industry. "IBM's heritage has been both a blessing and a curse," says McNamara. "It's imperative we overcome the impression that we're captive to IBM, however we're grateful for the world-class workforce, technology, processes and intellectual property inherited in the ownership transfer," he added. One of the largest remaining electronics packaging manufacturers in North America, the company is determined to maintain the technical expertise, resources and capabilities that many other companies have divested. These capabilities differentiate EI from other suppliers. Customers recognize the value of this immense experience and capability in solving electronics packaging issues under one roof and consistently refer to the company as "the best kept secret in the electronic packaging business".

## Best Technical Processes

While EI began operations with some of the best technical processes and expertise in the industry, it needed to develop much of the infrastructure and business processes that any new business requires. A lengthy implementation of SAP for Enterprise Resource Planning (ERP), establishing a sales structure and team and assembling an IT group from the ground up, were necessities. As the company embarks on its fourth year, diversifying the customer and market base, continued attention to product development and collaboration efforts are at the forefront. Today, their global presence includes headquarters in Endicott, N.Y., sales offices and sales representatives across the US and covering Europe, product warehouses throughout the world and EI, Inc. LLC in Hong Kong. Another step in the successful transition to becoming a merchant provider is developing strategies that support customer cost and quality targets. In North America, EI plans to grow new product introduction and launch activities while providing low volume, high mix, high technology applications and quick turn assembly solutions. In order to offer a full complement of product capability to customers, EI looks to leverage its technology in a lower cost region for high volume production of semiconductor packaging, assemblies and printed circuit boards. EI's Endicott, NY facility will continue to supply design services, product qualifications and provide dual source capability in support of offshore manufacturing. As a supplier of leading edge electronics packaging solutions that spends 4-5 percent of revenue on R&D, innovation and invention are also central to the firm's strategy. Since EI's inception, the flow of innovative ideas and the resulting patent applications have continued to flourish. The team at EI has filed over 70 U.S. patent applications and 9 have been awarded to date. EI's five year technology roadmap includes increasing levels of integration within the package including high density and optical interconnects and embedded passives, actives and cooling.

## Continuing R&D Lead

Without IBM's deep pockets and the escalating cost of electronics research, EI has become very creative with partnerships and collaborative efforts with academia, government and other private sector companies to generate capital and R&D. One such collaboration is the Center for Advanced Microelectronics Manufacturing (CAMM). EI, partnering with Binghamton University, Cornell University and Arizona State University is receiving funding and equipment from the U.S. Display Consortium and the Army Research Laboratory. The goal is to develop roll-to-roll electronics manufacturing processes capable of producing advanced electronics components typically found on silicon or quartz wafers. This will be the first facility of its kind in the U.S. to utilize roll-to-roll processing for this application. This new technology can be used for less costly versions of existing products, such as larger displays and it also has a broad range of applications for medical devices and military needs. Private sector companies such as Eastman Kodak, Philips, General Electric and Rohm & Haas are already members while many more are in the final stages of joining.

Similar collaborative efforts are underway with Georgia Tech's Packaging Research Center and The National University of Singapore to develop a perimeter array

semiconductor carrier. Additionally, EI is meeting with Clarkson University, Center for Advanced Materials Processing on materials research.

### Identifying New Markets

“When we began operations, IT (servers and telecommunications) accounted for 80 percent of business and our customer list was comprised of 7 companies,” says Jeff Knight, VP of Business Development & Strategic Planning at EI. “Just three years later, IT accounts for only 61 percent of our business with Defense /Aerospace, Medical and Automated Test Equipment making up the difference. Our customer list has grown to more than 125 companies,” he added.

EI has found a good fit in aerospace and defense markets because defense contractors are reluctant to move production of their electronic subassemblies out of the U.S. because of quality and security issues. As larger commercial electronic packaging companies have moved production offshore, there are only a few high quality producers left in the U.S. with deep technical capabilities. Recent wins for EI include contracts to supply several major components involving PC board design and fabrication in support of the E-2D Advanced Hawkeye Program for Raytheon Network Centric Systems. The company has also won a contract recently to provide organic semiconductor packages, module assemblies, printed circuit boards and functionally-tested circuit board assemblies. The medical device field is also a strategic fit for the firm’s semiconductor packaging, PC boards and assembly solutions. The company is also concentrating on advances in semiconductor packaging technologies and looking ahead to growth opportunities in telecom where high-speed and reliability are key attributes and IT where high speed and excellent electrical signals are important.

### Semiconductor Packages

EI’s semiconductor packages are organic substrates designed to provide superior electrical performance along with high reliability. These are very dense, light and thin packages and are available as single chip or system-in-package solutions. Products include wire bond plastic ball grid array (PBGA), a high performance package; HyperBGA®, a fluoropolymer-based coreless package; CoreEZ™, utilizing the HyperBGA manufacturing platform to offer a thin core build-up flip chip package with a lower cost and more reliable material set; and HyperZ, a coreless, PTFE-based flip chip package. EI’s offering includes 40+ layer counts, complex backplanes, various via configurations and multiple resin systems. PC boards are compatible with lead-free assembly processes.

Electronic Manufacturing Solutions includes 1st level, that is silicon to substrate assembly, as well as 2nd level, or component to PC board assembly. Process capabilities for 1st level packaging using flip chip, wire bond and system-in-package assembly techniques — including component placement and related assembly processes: underfilling, glob top, overmold, coverplate, BGA attach, part marking and test. 2nd level assembly capabilities include high complexity, high layer count PC boards with panel sizes up to 24 x 36-in., prototype and development parts, flexible manufacturing including full-box build, in-circuit test development and support, as well as functional

and systems test and field service/repair/upgrade and life cycle management.

Precision Equipment Manufacturing (PEM) supplies custom process equipment solutions. Teams of experts in robotics, sensors and measurement, control, motion, machine vision and product/material handling deliver a total system or individual services that address specific challenges.

Technical Services, one of the most comprehensive suites of lab services of its kind, is an essential part of EI's vertically integrated product offering. A very unique set of capabilities are created by combining science with manufacturing know-how to provide advanced lab engineering technology and product qualification services. EI's technical services include technology and product reliability qualifications, product qualification to customer specifications, extensive material and failure analysis and mechanical and thermal modeling. These techniques provide tremendous value to customer design teams working with EI.

For more information, contact: Endicott Interconnect Technologies, Inc., 1701 North Street, Endicott, NY 13760.

☎ 866-820-4820; fax:607-755-7000.

Web:[www.endicottinterconnect.com](http://www.endicottinterconnect.com)