A peek into Singapore's high tech manufacturing marvel

by Debasish Choudhury

Recently, I took part in a media mission to Singapore at the invitation of International Enterprise (IE) Singapore, the external trade development arm of the Government of Singapore. For me, it was a sought after, never-before opportunity to see Singapore's high tech manufacturing sector from close quarters.

Day One

Our tour program started with the visit to IE Singapore's office, where fellow editors and I got a sneak preview of Singapore's economy, trade, electronics and precision engineering industry and the role of IE Singapore in external trade development. Following a stupendous lunch hosted by IE at Man Fu Yuan restaurant at Hotel InterContinental, we set out for our first company visit to First Engineering Limited. Headquartered in Singapore, First Engineering was founded in 1979 and offers an integrated suite of solutions including product design, tooling, production and assembly services predominantly for the hard disk drive (HDD), PC peripheral, optical related products, life sciences, medical, business machines and automotive industries. The company has operations in Singapore, Malaysia, India (Chennai) and China.

Just as computers and electronics are indispensable in the IT age, First Engineering's products have become an integral part in people's lives. The company maintains its operational excellence through "Zero Defect" production line and quality assurance is maintained through certifications like ISO 9001/TS16949, EN ISO 13485:2003 and FE for environmental friendliness. "Box build approach is not our core business area, we are more focussed in mechanical engineering activities," said JR Ong, group managing director & CEO, during the media tour of the facility.

The next visit in our itinerary was Forefront Medical Technology (Pte) Ltd. Here we were welcomed by Mark Samlal, chief executive officer of VicPlus International Ltd., the holding company of Forefront Medical Technology (Pte) Ltd.

Forefront Medical Technology (FMT) is an integrated medical device contract manufacturer that offers a one-stop solution for the design, prototyping and manufacturing of components, sub-assemblies and finished product using a range of thermoplastic and thermo-set materials. Apart from Singapore, the company has opened up a production facility in Xiamen, China in January 2009, and has a base in USA as well.

"We spend close to 6-7% on R&D every year to keep us ahead of our competitors," said Mark Samal.

An operator on Beyonics Technology Limited's SMT floor.

Day Two

Day two of our media tour was most exciting because we got an opportunity to visit two renowned EMS companies of Singapore who have state of the art manufacturing facilities spread across two countries, Singapore and Indonesia.

We started the day with a visit to The Singapore Institute of Manufacturing Technology (SIMTech) at Nanyang Technical University campus. SIMTech develops high value manufacturing technology and human capital to enhance the competitiveness of Singapore's manufacturing industry by collaborating with multinational and local companies in the electronics, semiconductor, precision engineering, medtech and aerospace sectors, to name a few.

Stephen Wong Chee Khuen, director of SIMTech's Industry Development Office, welcomed us at the institute. Here he, along with his colleagues from EDB, SPRING

Singapore, IPOS and A*Star, briefed us about the working of different government agencies on capacity building of Singapore's EPE supply base. At the end of the presentation and discussion, we had a short tour of SIMTech facilities as well.

Thereafter, we headed for Beyonics Technology Limited, a leading EMS company in Asia offering one-stop manufacturing solutions. Established in 1981, the company is one of the world's largest manufacturers of HDD base plates and an EMS provider for HDD PCBA with an estimated world market share of 10-15%. The company is also a leading EMS for wireless/RF products in South East Asia and is an FDA-registered contract manufacturer for bio-medical products assembly services.

Here, we met CP Goh, chief executive officer of Beyonics Technology Limited, who has the sobriquet to be the "Best Financial Brain" in Asia's EMS industry. Prior to joining Beyonics, CP spent nearly 18 years at Flextronics, where he held a number of senior leadership positions in finance and operations. Under his leadership since 2000, Beyonics transformed from a precision engineering company to an integrated electronics manufacturing service (EMS) solutions provider for original equipment manufacturers (OEMs) and original design manufacturers (ODMs) in Asia.

The company has 100 state of the art SMT lines with lead-free/RoHS compliance for PCB assembly and box build products spread over eight campuses and five manufacturing plants located in five countries: Singapore, Malaysia, Indonesia, China and Thailand. It specialises in multi-mix, multi-volume production with clean room and flex-circuit assembly and can handle the smallest chip size of 01005 and the largest PCB board of 610 x 534 mm.

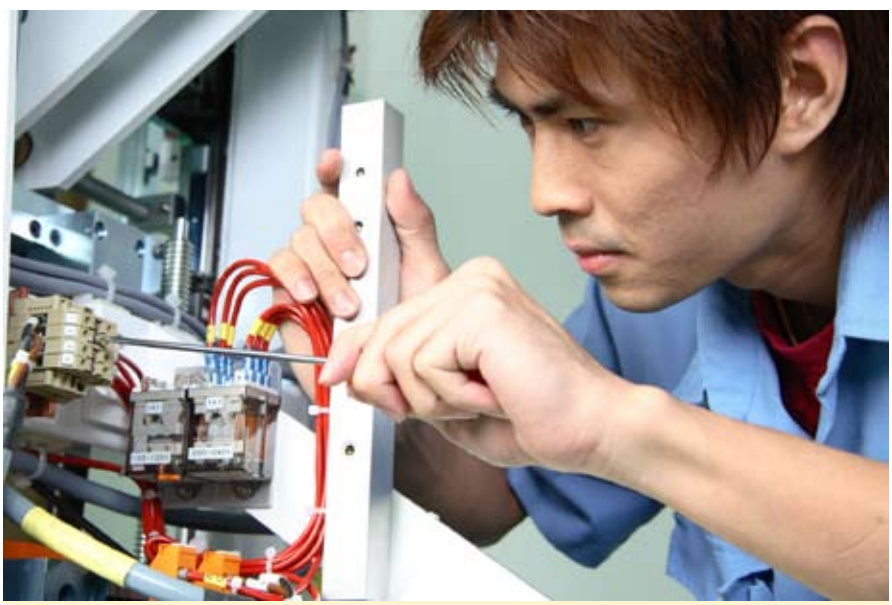
Beyonics acquired Seagate's Senai PCBA operation in Malaysia in Dec. 2007, and its successful integration into Beyonics family resulted in revenue jump to a record level of SG $1.41 billion for FY 2008 ending 31 July 2008. Some of Beyonics' noteable EMS customers in the IT/computers, telecommunications and consumer electronics sectors are Seagate, Quantum, Dell, Hauppauge, IKor, Panasonic, Motorola, Sony and Hitachi. In the automotive sector, the company serves Sensata and Seabato. In the medical & healthcare segments, the company's key customers are Baxter Healthcare and Animas Corp.

While talking about future road map for the company, CP Goh, CEO of Beyonics, said, "We have a very interested company to partner with us for bio-medical products, but no plans to do a JV in EMS in future." He added, "Reliability, quality and supply chain is important in medical product manufacturing, not price."

After a quick lunch at Singapore's Harbourfront Center, which acts as a gateway to Santosa Island and Ferry ride-in & out of Singapore, we set out for Batam Island in Indonesia. At the immigration checkpoint for ferry ride-out of Singapore, we met Hung Nyet Hiong, director, engineering, of CEI Contract Manufacturing Limited (CEI), who accompanied us, along with his colleague Lam Kwok Wing, during their facility visit in Batam, Indonesia.

CEI's manufacturing facility is located at PT Surya Teknologi, Batamindo Industrial Park in Mukakuning, Batam. Developed by Singapore's Sembcorp Industries, which is majority owned by Temasek Holdings, Batamindo Industrial Park (BIP) is the pioneer industrial park in Batam. BIP is a huge beneficiary of the Framework Agreement between Indonesia and Singapore on Economic Cooperation to develop Special Economic Zones in Bintan, Batam and Karimun Islands in June 2006. It was conferred Free Trade Zone status in August 2007, and offers preferential duties under the Generalised System of Preferences and ASEAN Free Trade Agreement. Other special features are no value added tax (VAT), protection of investments and 100% foreign ownership. The park has single-handedly transformed the economy of the island by attracting global manufacturers, which has created employment for more than 60,000 workers and contributes significantly to Indonesia's

Assembly line at CEI Contract Manufactuing Limited.



Manufacturing Integration Technology Ltd /AMS Biomedical

Assembly area at CEI Contract Manufacturing Ltd.

non-oil and gas exports.

CEI Contract Manufacturing Limited was established in 1980 under Singapore Technologies to provide electronics manufacturing services (EMS) to the government's defence requirements. Thereafter, the company went through different phases of transformation and, in 2008, acquired IC Equipment Pte Ltd. to strengthen its equipment manufacturing capability apart from its core business of high-mix/low-volume PCB assembly and testing and box-build solutions. A small part of the EMS caters to the high tech medical and life sciences segment as well.

CEI has manufacturing sites in Singapore, Batam (Indonesia), Ho Chi Minh City (Vietnam) and Shanghai (China), with a total floor space of 166,000 sq. ft., but the company employs only 882 people. The company's PCB assembly process capability includes 10 SMT lines complete with loader to reflow oven—all RoHS-compliant—and can handle boards up to 630 mm x 570 mm. It also has seven manual insertion lines complete with wave soldering machines. Three of these lines are RoHS-compliant, with a dedicated line for aqueous base and a no-clean base soldering system. It also has de-ionized water cleaning and ionic contamination testing for aqueous process PCBAs, and a conformal coating facility. Other important features are HMP and N2 reflow for high melting point soldering and full implementation of ESD and J-STD 001 soldering requirement for PCB assembly. The contract equipment design & manufacturing caters to semicon's front & back end equipment, PCBA's AOI equipment, medical equipment, UV/ laser handler and UL 508 electrical control panel.

Day Three

Day three of our media tour started with visit to Onn Wah Precision Engineering Pte. Ltd. Established in 1961, the company specialises in contract manufacturing of precision components focussing on high-mix, low to mid volume, and assembly services for OEM equipment and modules.

"The company intends to grow its single digit semi-con equipment assembly business to double digit by 2011," said Francois Beaufrere, general manager of the company. "Also, plans to move up the value chain to make a complete sub-assembly of a machine." Trained under management guru Dr. Richard Schonberger, Francois was a lean manufacturing (16 point) consultant to a number of companies in Asia-Pacific region before taking up Onn Wah management's request for a full time assignment with them.

Apart from Singapore, the company has a plant in Suzhou, China, and practices the lean manufacturing concept for operational excellence. It caters to aerospace, electronics/electrical, electronics equipment, medical, photonics and the oil and gas sectors through its unmatched manufacturing services. Onn Wah has received a numerous awards over the years. The last one was "Singapore SME 500 Company" in 2007.

Next we visited Manufacturing Integration Technology Ltd (MIT Group). Established in 1992, the MIT Group to has three business divisions: semiconductor equipment manufacturing, contract equipment manufacturing for medical, and precision engineering. While the first two divisions are based in Singapore, the last is based in Shanghai, China. The semiconductor equipment manufacturing has been the main revenue contributor of the MIT Group and is expected to continue to strengthen its growth. In 2007, MIT acquired AMS Biomedical Pte Ltd. to build its competencies in the non-semiconductor businesses and diversify into another growth area, such as the contract equipment and devices manufacturing for the medical industry.

"Designing is the strength of MIT since its inception," said Calvin Teo, head of Group Corporate Services. "We are keen to explore opportunities in multiple growth areas, including aerospace, solar and oil and gas using IE's expertise."

After visiting two high tech contract equipment manufacturing companies, we headed for Rayco Technologies Pte Ltd, a precision elastomeric solutions specialist. Here, we had a lavish lunch and then sat down for a corporate presentation followed by shop floor visit. Rayco is a specialist in producing miniature components used in medical devices, lifestyle, data storage, electronics, automotive and aerospace industries. The company exports 70% of the products to the US & Europe and follows strict international quality standards, such as ISO 9001, ISO 14000 and TS 16949. In addition, the company has PSB-ODS Free Certification for compliance to RoHS and Green Metrics standards. Since its inception in 1954, Rayco achieved a number of milestones and awards, the most coveted being the "Rubber Technology Centre" status conferred by EBD, Singapore.

We wrapped up the media tour with the visit to Rayco and headed back again to the IE Singapore office for a discussion on the hurricane three-day tour. This tour provided me a lot of information and first-hand insight into Singapore's manufacturing companies in the high technology areas of electronics and bio-medical. I have tried to download the information overload created in my brain and am feeling much better now. I am sure you would like this partial tour of Singapore's high tech manufacturing industry through my eyes.