

What's up, doc?

The healthcare industry is one of those least affected during the recent financial crisis. After all, people still fall ill and require medical attention, and spending on healthcare needs continue

Singapore, one of the first economies to enter into a technical recession, has announced stellar economic growth the first half of this year. On a year-on-year basis, manufacturing output rose a whopping 58.6%, reported the Economic Development Board (EDB).

The agency further reported that output from the biomedical sector expanded 117.0% year-on-year in May, largely due to the pharmaceutical segment which grew 121.8% during the same period. In the first five months this year, biomedical output grew 78% compared to the same period a year ago.

The medical technology sector (medtech) sector is one of Singapore's fastest-growing, contributing S\$3 bil (US\$2.2 bil) in manufacturing output and employing 8,300 people in Singapore.

Singapore-based moulder Meiban jumped onto the medtech bandwagon back in 2003/2004. Today, Meiban has over 10 injection moulding machines, ranging from 50 to 200 tonnes, to produce plastics consumable parts, mainly in Singapore and some in China. A class 10k cleanroom in Singapore houses European and Japanese machines.

Meiban produces parts to support multinational healthcare companies which have bases in Singapore, a hotbed for life sciences. The parts are sent to these customers in Singapore as well as their operations in the US and Europe, said William Tang, general manager of Meiban Micro.

Since medical parts can potentially determine the outcome of human life, moulding for this sector is much more demanding. Meiban has invested in a large amount of resources, such as in applying for ISO 13485 certification, to ensure that proper quality systems are in place.

On the other hand, machinery makers like Husky has introduced new machines targeted at medical parts.

The primary requirement for these machines is gate quality, explained Dinesh Budapanahalli, Husky vice president of sales, global hot runners and tooling, followed by part consistency, reliability, multi-cavity tooling and low scrap rates. Some parts are very

complex and have to be made in cleanrooms.

Nonetheless, medtech is still an attractive part of the business, said Tang, and will become sustainable in the long run.

Lately, Meiban has been receiving more enquiries to produce fully assembled products. Tang views the medical business as a growing and strategic one and expects sales to "grow a few folds". He is confident that Meiban "will definitely expand".

Experts believe that the healthcare industry will continue to grow, largely because of

ageing population worldwide. As a result of decreasing mortality and increasing life expectancy, there will be more old people.

According to the United Nations report *World Population Ageing 1950 - 2050*, the number of older persons in the world will exceed the number of young for the first time in history by 2050. This reversal has already taken place in more developed regions, it added.

As the world population ages, so will the demand for more and better healthcare facilities.

Specialty plastics for pharma industry

Polysteribox by German labware and medical producer Ritter is an ideal transport and storage container for the medical industry since it is transparent, so its contents can be seen at a glance, and it can be sterilised.

Compared to when the polysteribox was first developed in the early 1990s, the standards for cleaning and sterilisation today are much higher, leading Ritter to find a new material - the Ultem polyetherimide (PEI) from Sabic - for this award-winning design.

"Today's healthcare industry is incredibly dynamic, requiring the latest material solutions to meet new safety, quality and cost demands from regulators, clinicians and the public," said Rob de Jong, specialty product manager at Sabic Innovative Plastics.

With the new material, polysteribox is suitable for autoclave vacuum sterilisation at 121°C or 134°C. It can also be sterilised using plasma or gas (formaldehyde and ethylene oxide) at a maximum temperature of 65°C and at twice the ventilation time than for a metal container.

The enhanced Ultem healthcare resin grade, which meets ISO10993 certification criteria for biocompatibility, maintains its



high performance and attractive, transparent appearance even after 1,000 cycles of chemical cleaning at pH 12 or 13 and 1,000 cycles of autoclaving at temperatures of up to 148°C.

"We were using a different grade of Ultem resin for the Polysteribox container when we learned about the new chemical cleaning and autoclave requirements," said Michael Fuchs, Ritter Medical Products manager.

"Sabic Innovative Plastics (developed) a new grade meeting our specifications, which included high stiffness, ductility and compressive strength, transparency to see inside without opening the container, and colourability."

Life sciences choose plastics

The medical plastics industry is a multi-billion dollar market that continues to grow as researchers uncover more uses for this versatile material, reports Frost & Sullivan

A brief glimpse into a doctor's briefcase, a surgeon's operating theatre or the inside of a well-equipped ambulance will reveal many different important medical devices, tools, and supplies made from plastics. Recent advances in polymer materials have taken the healthcare world by storm, pushing the boundaries of convention and inspiring new innovations for the use of plastics to save lives.

The plastics medical industry can be segregated into applications for medical devices and medical packaging. Medical devices include implants, replacement joints, disposable syringes, catheters, medical pouches (such as blood bags), labware, therapy equipment, artificial limbs, medical tubing and many more. Medical packaging applications include packaging for blister packs, clamshell packs, medical trays and medical device packaging. Common polymers used for medical applications utilise polypropylene, polystyrene and PVC, as well as high-performance materials such as UHMWPE and PEEK.

Key drivers for medical plastics

Compared to conventional materials such as metal and glass, plastics offer the added advantage of design flexibility, strength, increased biocompatibility and ease of extrusion into desired shapes. Its durable and lightweight properties make it suitable for prosthetic limbs and bodily implants. Clear polymers which allow doctors increased visibility has also found multiple uses for transfusions, surgeries and diagnostic equipment.

With medical costs on the steady incline, doctors, hospital administrators, laboratory staff and patients alike are seeking ways to reduce medical costs, without compromising on product quality. This in turn has developed the market for disposable plastic medical supplies, with high demands for cheap, plastic alternatives to conventional medical equipment which need to be cleaned, sterilised and reused.

While other industries have been hit by the global economic slump, the healthcare market (with medical plastics in particular) has shown resilience. Advancements in polymer technology have developed plastics which comply with the strictest healthcare regulations, leading to an increasingly prev-

alent shift of polymer producers towards medical applications. Extensive research into new materials with improved characteristics has yielded plastics that satisfy even the most rigorous infection control standards.

Escalating healthcare costs and long hospital waiting lists has encouraged a new trend of home health treatments. With patients preferring home to hospital, there is a growing need for easy-to-use low cost medicine dispensing equipment and diagnostic devices. This consumer market has led to demands for smaller, lighter but sturdier devices, often with design as crucial as functionality – trendily designed equipment that versatile plastics can easily accommodate for. Medical devices may soon need to adopt fashionable colours, high portability, and innovative designs to keep abreast with changing consumer tastes.

This coupled with the medical demands for an ageing population has expanded the use of plastics. In an era where people wish to enjoy an active lifestyle well into their twilight years, plastic-containing devices such as artery-opening stents, heart pacemakers, and hip replacements have become indispensable for improving the life quality for a growing older population.

Challenges and future trends

Due to the highly-regulated nature of the market, plastic manufacturers face many product testing, certification and approval requirements before the product can be deployed into hospitals. This is a deterrent for many manufacturers who wish to enter the medical plastics market, as complex regulatory processes may incur additional production, research and operating costs. These strict requirements also mean that the development of new plastic medical applications will be slow-to-market as significant upstream testing and obtaining of approvals will be

needed.

Despite this, advancements in healthcare and the increasing quality of treatment will increase the demand of high-performance plastic medical devices, as plastics often can go where glass and metal cannot. For instance, the study of bioplastics and the biocompatibility of advanced plastics have unlocked new frontiers for how specialised resins can be applied to improve lives.

In an age where sustainability, green manufacturing and environmentally friendly processes have ceased to become the exception but rather the rule, the appeal of the recyclability of plastics is clear. Hospitals too, are increasingly demanding devices that are lighter in weight and have thinner wall thickness, reducing the amount of materials that eventually are disposed of once the product has reached the end of its life cycle.

For plastic suppliers, medical plastics represent more of a niche market with high investment needs compared to other plastics industries. Some manufacturers have chosen to skirt the industry, supplying non-implantable devices or specifically excluding the use of its polymers in devices implanted for more than 30 days. Other industry players have dove headlong into the market, developing new innovations and applications for plastic bionic implants, PEEK for spinal implants and high-performance thermoplastics for orthopedic use.

The Asia Pacific medical devices market is making a steady comeback after the global recession of 2009, showing the strength and potential within this market. Frost & Sullivan forecasts a CAGR of 10.2% from year 2009 – 2012, with this sector being worth US\$62.3 bil in APAC by 2012; a contribution of 25.8% of the global market. In short, there is great promise for the future of medical plastics for producers who view this market as untapped opportunity.

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