

Many exhibitors at this year's Chinaplas seemed to have drawn inspiration from nature. Low carbon footprint, bio-materials, energy-saving processes are hot buzzwords. APN gives you an overview of the technologies presented

This year, Chinaplas organiser Adsale themed Asia's largest plastics show "Green Plastics. Our Goal. Our Future". A series of seminars named An Industrial Forum on Green Technology was set up at the sidelines for plastics machinery as well materials companies to publicise their contributions to the movement.

This year, there are many products that focused on sustainability.

Large beverage companies are looking into ways to reduce the amount of packaging they use. For example, Coca-Cola's PlantBottle scheme aims to complete the packaging cycle by reducing, recovering and re-using more. PepsiCo wishes to incorporate at least 10% recycled PET into soft drink containers in the US and then expand to international markets as well as increase recycling rates and reduce overall packaging weight.

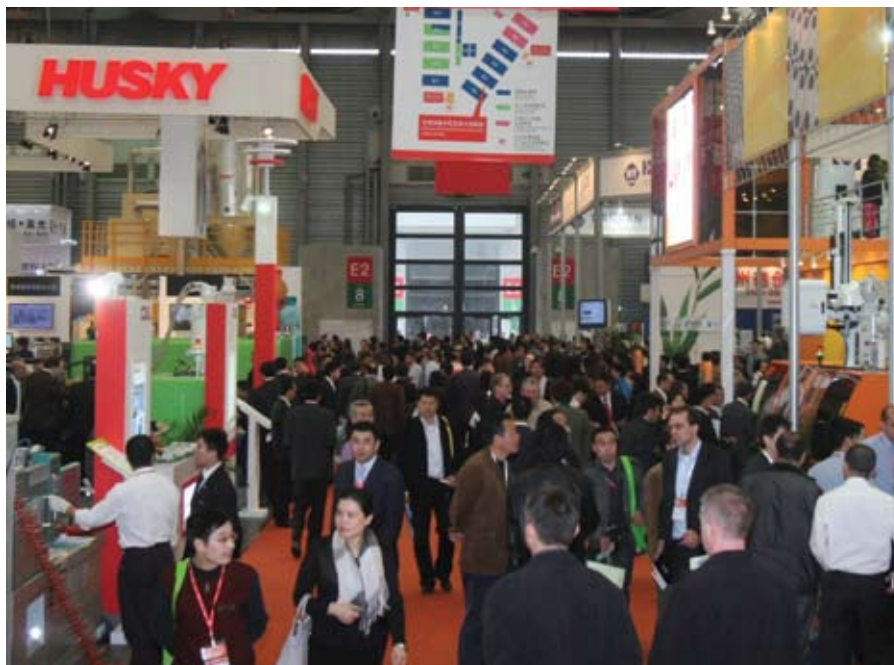
For such aspirations, Husky launched the HyPET HPP injection moulding machine that can incorporate up to 50% post-consumer PET flakes into food-grade preforms. Since recycled flakes can be easily combined with virgin materials, Husky is making it simpler for bottlers to switch to this method to lower their carbon footprint. Furthermore, Husky has patented a new EcoBase preform design that alters the conventional preform the industry is used to and this new shape gives the benefit of reducing part weight by up to 2.5%.

Other machinery makers focused on reducing the amount of energy their machines uses. Electric injection moulding machines have been popular because they use less energy, but they usually cost more and are typically reserved for more expensive electrical and electronic parts.

Haitian told us that more customers are buying their electric machines for packaging purposes. Helmar Franz opines that the economics of higher-priced machines has finally caught up with the rising cost of resources.

When price cannot be compromised, machinery companies improve on features such as cooling rates and production cycle times.

Clean and green



On the materials front, several new bio-related products were launched.

Poly(lactic acid) (PLA) technology is well-established for packaging. However, the base material for PLA is corn and debate is on-going over whether corn should be channelled towards industrial uses, for example bio-fuel and bio-materials, rather than feeding millions of hungry people.

There is also a broad interpretation of what "bio-based" means.

Bio-based can refer to a product that is biodegradable, which means the material can be broken down by the action of living organisms. Or it can mean that the product contains plant or animal components.

DSM has developed an engineering plastics called EcoPaXX which is made from castor oil. The company is clear that it would not compete with a food source, and castor beans grow even on wasteland. The EcoPaXX material has a low (almost zero "cradle to gate", according to DSM) carbon footprint because the plant absorbs carbon dioxide as it grows, thus negating the amount emitted during the production process.

EcoPaXX is, however, not degradable. We would not want our vehicle to disintegrate while we are driving it, whether for the next 5 years or 15 years.

PLA, too, has biodegradability issues. It is said to become CO₂, water and biomass at temperatures above 60°C after around 30 days. However, PLA has been found to be fully compostable only at specialised indus-

trial facilities and not necessarily at landfills, which is where most packaging wastes end up.

Wood plastics composites are also a kind of bio-material. Besides wood flour, more "environmentally friendly" options like bamboo are being used to blend with plastics. These are already commonly used for decking or garden structures and suppliers like PolyOne are constantly improving on resistance to weathering, mould, mildew and water absorption.

While solutions for sustainability are many, there is one major problem that has to be overcome and that is price. Being friendly to the environment usually means one has to pay more. Some materials companies hesitate to comment on the cost although they said their products would pay off "in the long run".

Consumers who choose to be "green" have to pay more for their organic foods, whether they be vegetables, meat or dairy products. Biodegradable plastics bags, although readily available, usually cost more than conventional ones. In many surveys conducted worldwide, higher costs prove to be the biggest obstacle to consumers who want to be green. Going green is a trend led by the middle class, say critics.

Nevertheless, the middle class is growing and so is the awareness for environmental concerns. Industry players are betting on the green movement so we can look forward to more sustainable products.

Borouge 1, 2, 3, go!

Borealis and Abu Dhabi National Oil Company (ADNOC) joint venture Borouge currently produces 600,000 tonnes of polyolefins per year. In another few more months, the completion of the Borouge 2 project will see capacity triple to 2 million tonnes per annum.

Borouge 2 consists of an ethane cracker processing 1.4 million ethylene each year, coupled with a 750,000 t/y propylene conversion unit. The integrated project located in Ruwais, Abu Dhabi will have 2 PP plants with combined capacity of 800,000 t/y and 3 PE plants producing 1.2 million t/y.

Even as Borouge 2 is starting up mid-2010, Borouge 3 is already under construction to expand overall capacity up to 4.5 million t/y. This phase is scheduled to complete in 2013, said William Yau, CEO of Borouge's marketing company in Singapore. Also incorporating an ethane cracker, Borouge 3 is expected to produce 950,000 t/y of PE, 900,000 t/y of PP as well as 350,000 t/y of LDPE specifically for wire and cable applications.

As the production facilities are being built, Borouge is setting up a logistics network to serve its customers, especially those in China,



Yau explained. Rather than shipping from the Middle East, there will be 3 major logistics hub in Asia to reduce lead times: 300,000 t/y from Singapore to south-east Asian customers; 300,000 t/y from Guangzhou to customers in southern China; and finally 600,000 t/y from Shanghai to eastern and northern China.

The automotive and appliances sectors are two growth areas for Borouge in China. A PP compounding plant in Shanghai processes 50,000 t/y, or up to 80,000 t/y if need be. As this plant was inaugurated in April, Borouge announced a second 105,000 t/y PP compounding plant in Nansha, Guangzhou. This plant is expected to complete around middle of 2012.

Not neglecting the development of new applications, Borouge will be building an application research and development Centre in Shanghai as well as an Innovation Centre in Abu Dhabi. The Abu Dhabi Innovation Centre will be built at a cost of US\$70mil and will be complete end of next year. It will tie up closely with Borealis' Innovation Centre in Linz, Austria and education institutions in the Middle East.

During Chinaplas, Borouge signed an agreement to sponsor 14 undergraduate scholarships with Beijing University of Chemical Technology to attract and train Chinese young talents for the petrochemical industry.

DSM highlights green solutions

Stanyl CR is a new generation of halogen-free high temperature PA whose UL94-V0 flammability rating is suitable for use as connectors. This new products shows improved flow compared to previous versions.

"Electronic tier-ones and OEMs have been driving towards products with the least impact to the environment, hence the drive towards halogen free," said Dr Huang Yi-bin, research and technology director of DSM Engineering Plastics Asia Pacific.

DSM also showcased its EcoPaXX bio-based engineering plastics that is said to be carbon-neutral from "cradle to gate". About 70% is made from castor oil, a renewable source that is non-food-based and the plant can be grown in relatively poor conditions. DSM explained that a low carbon footprint is possible because the amount of carbon dioxide released during the production process is compensated by the amount that was absorbed while the castor plant grows.

Based on the PA410 material, EcoPaXX exhibits physical properties such as low moisture absorption, high melting point and high crystallisation. It is suitable for demanding applications such as automotives and E&E.

DSM said that it is perhaps the only company so far to produce engineering plastics with a melting point as high as 250°C using plant-based resources. At Chinaplas, DSM put on display an oil pan made of GF-reinforced EcoPaXX.

President of DSM Engineering Plastics Asia Pacific, Jayant Dhobley admitted that the new bio-materials are more expensive than petroleum-based ones. However, given the enormous benefit to the environment, its customers (OEMs) and end-users will appreciate the value of this product.

Despite the economic situation, consumption is still going up, Dhobley added. More people want personal transportation and electronics like computers. Consumer activities like these drive the demand for materials. As the end market grows, the demand for low-carbon goods will be amplified. DSM will do its part to improve energy efficiency and lower its carbon footprint.

In company news, DSM announced that it would be setting up a materials research and automotive development centre in Shanghai. This will be DSM's largest research centre for engineering plastics outside the Netherlands. Some advanced material test-



ing and characterisation are now being carried out at the company's manufacturing site in Jiangsu province. The new facility will be housed in DSM's new LEED green building in the Zhangjiang Tech Park in Shanghai. Several million dollars will be invested in the coming period, said Dhobley, with the first steps starting end of this year.

Dhobley foresees China will be the world's largest engineering thermoplastics market in 3 to 5 years. DSM wants to be close to customers and develop materials and applications for this market. Besides European mainstays, it is "actively pursuing cooperation with Chinese car makers including Chery, Geely, BYD and Dongfeng, as well as tiers one and two.

Asia continues to be an important market. DSM will expand its manufacturing footprint in China and India end of this year.

ExxonMobil celebrates 50 years in the PP business and sets high hopes on the Asian market. China is already the world's largest consumer of plastics raw materials. ExxonMobil expects half of the world's PP consumption to be in China in the next 10 years, said Tom Raia, global marketing manager for consumer/industrial markets of the PP business unit.

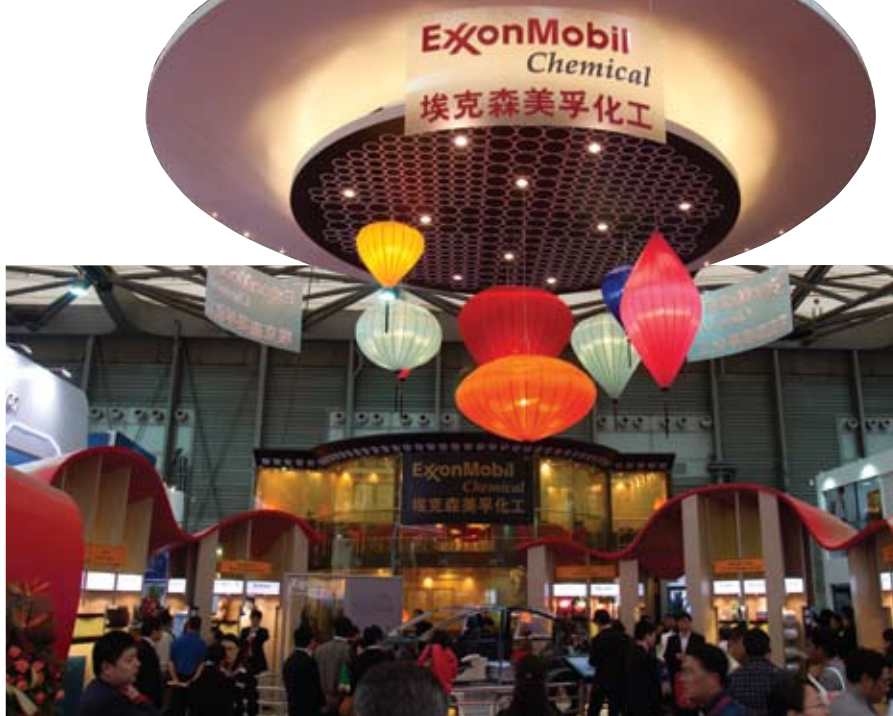
With its integrated refining and ethylene project in Fujian, ExxonMobil will produce and sell to customers in China. The integrated chemical and refining site in Singapore, ExxonMobil's largest in the world, will supplement this supply. Steven C K Poon, Asia Pacific PP sales manager said ExxonMobil benefits from tariff exemption under the ASEAN-China Free Trade Agreement (AFTA) where it can export polyolefins from Singapore at zero duty.

While many parts of the world were suffering from recession, China's domestic market actually grew, Poon said. Thanks to the government's stimulus programme, many Chinese consumers could go out to purchase household appliances such as refrigerators. The scheme worked well because consumers could see an immediate discount on their sale price and some were buying the appliances for the first time, anyway.

Poon observed that the Chinese market is becoming more sophisticated and more receptive to quality than, say, 5 years ago. China's export segment is still important but domestic demand will continue to grow.

"We hope this year will be a good combination of these two factors," he said.

Raia also told *APN* that many customers in China's appliance industry he had spoken to, both international and local brands which had mostly been producing for export, are talking about modifying their products for the Chinese domestic market. He would not



Meeting customers where they are

say what type of 'modifications' they were referring to but he "had heard the most of it in the last 6 months".

ExxonMobil introduced 3 new grades of PP at Chinaplas. The first, PP7555KNE2, is a high flow impact copolymer PP for thin-walled injection moulded containers that showed better performance at lower cost.

ExxonMobil conducted a survey among its customers around 18 months ago, said Poon, and learnt that food packaging is an on-going need in Asia. PP is set to replace existing food-contact materials like PS and PC, however safety is a top concern especially amidst recent health scares in China. The new PP7555KNE2 was developed in the region to meet customer demands like low odour and taste transfer.

Development of new products for the local context gains traction as demand in

Asia grows. ExxonMobil's new US\$70mil Shanghai technology centre located in Zizhu business park, where 200 researchers and engineers will be located, will play a significant role. The centre is expected to start operations in Q4 this year.

The second new grade PP7684KN is an impact copolymer for a broad range of applications, including large appliance parts and consumer goods, and as a compounding base material. Its versatility means that it meets the requirements across several grades, thus lowering inventory stocks.

Lastly, PP7032KN is designed for heavy-duty applications that require high stiffness and impact strength. The mechanical properties of this resin offer cost savings since part weight is reduced, and shorter cycle times due to fast crystallisation and easy mould release.

New Ticona POM for automotives

China is a very important market for Ticona, said Wilfried Jobst, commercial director of Ticona Asia Pacific.

China is now the second largest car market in the world after the USA. Presently, only an average 2 pounds of plastics (1 kg or less) is used in each China-made vehicle compared to around 10 to 14 pounds for vehicles made elsewhere, explained Jobst. On top of that, the motorisation rate in China is low compared to the US and Europe. Add together these factors, and there lie the potential of tremendous growth for plastics suppliers like Ticona.

At Chinaplas, Ticona launched the new

Hostaform HS 15 POM that combines the mechanical strength of homopolymers and chemical resistance of a copolymer. Ticona engineered the backbone of the acetal copolymer structure to improve the mechanical properties. Hostaform HS 15 shows good thermal stability, thus reducing deposit build-up during processing.

Since it shows high resistance to aqueous media including bases as well as solvents and automotive fuels, this material is suitable for under-the-hood parts such as gears, safety parts and window lifts.

While the price point for high-tech materials like Hostaform HS 15 is relatively high for

Chinese manufacturers, the long term benefits will prove its price effectiveness, said Ticona Asia Pacific's product management/marketing manager Stuart Yelland. Customers will notice processing advantages such as shorter cycle times and less frequent mould changes.

Jobst observed more and more auto OEMs carrying out R&D in China. The local car manufacturers are showing interest in Ticona's products.

"We find them (Chinese companies) not as experienced but they are eager to learn and are open-minded and interested in new technology," Jobst said.

New products extend customer reach

Patience may be a virtue but people nowadays just want convenience. For instance, sausages that are popular in China can be vacuum-packed and enjoyed all year round. Advanced packaging solutions from companies like Dow allow these foods to be kept fresh, going without refrigeration for longer periods of time. This means that pre-packed foods can be sold at wet markets as well as supermarkets, and be transported over longer distances to people living outside the main cities. Furthermore, for many families in the rural villages who still do not use refrigerators, this technology solves the problem of storage.

Flexible packaging is increasingly replacing rigids like tin, paper and glass, said Luiz Stortini, Dow's global business director for specialty packaging and films. Plastics are also lighter, thus lower transportation costs. In China, the growth of food packaging is about 3% above GDP.

As packaged food becomes more common in China, there is more competition among brands and their products. Packaging becomes a tool to raise awareness of the brand.

At Chinaplas, Dow announced two new shrink label films for roll-fed shrink labels in the



Opticite family. Opticite 48 and 61 provide more than 40% shrinkage in the machine direction on highly contoured containers in hot air, infra-red and combination shrink tunnels. Dow believes that the new label films allow cost effective point-of-sale differentiation for brand owners.

Not only does do the new Opticite offer good printability and high clarity on PS films,

they show minimal cross-direction shrinkage and low shrink force, resulting in crisp and smooth graphics. They provide the eye-catching appeal of full-body contoured label using high-speed roll-fed equipment while reducing off-line seaming and inspection steps usually associated with the transverse-direction shrink sleeves.

In August last year, Dow introduced Dowlex NG LLDPE resins which were produced with modifications to the Ziegler-Natta catalyst, resulting in better strength ratio and optics, explained Sudjali Halim, marketing manager for basic plastics for Dow in the Asia Pacific. The XUS 61530.02 grade LLDPE is well-suited for applications such as heavy duty shipping sacks and downgauged lamination films because of its combination of dart, tear and puncture balance, outstanding clarity and gloss, good melt strength and bubble stability.

Since Dow's new grades of LLDPE resins are stronger, film thickness can be reduced to achieve the same strength, thereby lowering cost of production. This is especially important in emerging markets where cost considerations often outweigh performance. By using less material, brand owners can better achieve their ecological goals.

APN 2010

www.apn.com.sg

Anytime • Everytime

Get exposed on our site to your prime customers

Enquiry: annie@apn.com.sg