

# In the pursuit of innovation



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Welcome to the K-2007 issue of Engineering Design. The K show (K stands for Kunststoffe – the German for plastics) is widely considered to be the world's number one international trade fair for plastics and rubber, with over 2,900 exhibitors and 230,000 visitors expected to attend in Düsseldorf, from October 24-31, 2007. At the show, and in these pages, we will be focussing on our vision for 2010 – that of "Giving Shape to Smarter Ideas". In other words, how our materials and global expertise can combine to promote innovation and help customers get to market faster, with better products, more cost effectively.

While customers benefit through significantly reduced costs, consumers benefit through improved design features. There are a number of trends driving innovative, new ideas that turn into successful new materials, and new development opportunities for our customers.

#### ***A sustainable agenda***

Consumers in many markets are showing their support for sustainable products at the

checkout. At the same time dozens of retailers – increasing every day – are differentiating themselves beyond price and convenience with sustainable products and practices. While young, the leading indicators say sustainability is a means of differentiating. At DuPont, we believe what's good for business must also be good for the environment and for people everywhere in the world. Hence, we recently announced our intent to expand business offerings addressing safety, environment, energy and climate challenges in the global marketplace. This will be achieved through a series of programs.

#### ***Renewably-sourced materials***

In our business, we have focused on the need to develop polymers from renewable resources. In the biorefinery model, Bio-PDO™ (propanediol, an intermediate for DuPont™ Sorona®) is derived from corn sugar using a patented and proprietary fermentation process. Produced in such a way, Bio-PDO™ takes 40% less energy than its petrochemical-based counterpart saving the equivalent of 13.5 million gallons (over 51 million

liters) of gasoline for 100 million pounds (over 45,000 metric tons) per year of production. The processing facility we constructed with Tate & Lyle to make Bio-PDO™ is already operational and had its grand opening ceremony in June. Bio is thus a reality!

#### ***Fuel economy, reduced automotive emissions, lightweighting***

While there is some debate on the number, vehicle use emissions are often blamed for up to 75% of CO<sub>2</sub> releases globally. At DuPont there are dozens of programs in place to greatly reduce CO<sub>2</sub> emissions – including developing advanced bio-fuels. In terms of engineering polymers, we are working in focused areas to improve barrier technology that significantly reduces permeation and on material enhancements that meet the challenges of aggressive alternative fuels. Reducing weight improves gas mileage, which also reduces emissions – 25 kilograms (55 pounds) means a one percent increase in fuel economy – critical to automotive engineers challenged to provide additional content without adding to vehicle weight.





*DuPont is focussing on the need to develop polymers from renewable resources: Bio-PDO™ is derived from corn sugar using a patented and proprietary fermentation process.*

### **Improved product performance**

Improving product performance is critical for many of our customers fighting to stand out in a crowded marketplace. This trend exhibits itself in automotive through extended warranties, improved customer satisfaction ratings. In the consumer products markets it reveals itself by differentiating higher-end items. In industrial products, we see this trend emerge as the desire for equipment that doesn't require continual maintenance and inspection. Since 2004 we've launched more than 115 new products to improve overall product performance, some of which are reflected in this issue.

### **Human connectivity**

Some studies show that consumers in developed countries have reached saturation point in terms of accessibility products, but people in emerging countries are driving demand for devices that continue to flatten and connect our world. That translates into billions of mobile phones, laptops, handhelds – and it translates into billions of connectors, housings, displays, etc.

While we provide material solutions for cell phones, laptops and handhelds, the trends to make them smaller, lighter, more aesthetically pleasing and recyclable will drive the need for higher temperature materials, halogen free materials and multi-functional materials – those that provide strength and beauty.

These are just some of the market trends, where high-performance materials, experienced design and development experts linked globally can "Give Shape to Smarter Ideas" – today and into the years to come.

Weight reduction is obviously great news for plastics; and we actively work with our automotive customers to reduce weight and improve performance. On page 4 of this issue, Nandan Rao, Technology Director for DuPont Performance Materials, covers nanocomposites and how they are poised to offer a step change in structural performance to replace heavy, structural metal components and systems.

### **Automotive safety - pedestrian safety requirements**

Delivering safety-systems solutions in the automotive industry requires precision engineering – reliability is paramount – and this

demanding environment has long been an area of expertise for DuPont. Our material solutions in this area already range from developing DuPont™ Butacite® for laminated automotive windshields and DuPont™ SentryGlas® for sunroofs and side windows, to optimizing the flexibility characteristics of DuPont™ Hytrel® thermoplastic polyester for air-bag doors, and tapping the mechanical reliability of DuPont™ Delrin® acetal for automotive safety belts. What you will read about later in this issue is how new developments in polymers can help our customers improve pedestrian safety.

*The dawn of industrial biotechnology: the DuPont Tate & Lyle Bio Products Bio-PDO™ facility in Loudon, Tennessee.*

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