

Matrix Polymers seminar aims to drive down rotomoulding costs

Rotomoulding materials specialist Matrix Polymers attracted an excellent turnout to a technical seminar at its Northampton facility on 8 March, on the theme "Reducing Cost". Contributions from Matrix staff and guests addressed the state of the polyethylene market, quality and productivity enhancement through a novel material formulation, shot weight reduction by both finite-element analysis and product development methodology, the best packaging choices for rotomoulding resin customers, and how to refine cooling control for the rotomoulding process.

Polyethylene – Another year of surprises?

Michael D Smith, director of polyolefins and PVC Europe/Africa with the consultancy Chemical Markets Associates (CMAI), offered insights into the dynamics of the polyethylene industry, focusing on the feedstock supply chain and other main drivers.

Smith sketched the 2010 situation in the following terms:

- Stronger than expected demand;
- Periodic shortages of ethylene, propylene and some polymers;
- An inordinate number of polyolefin plant *force majeure*;
- A high degree of producer discipline;
- Significantly higher prices and margins.

From historical data, Smith derived a "rule of thumb" that a US\$1 change in price of Brent Crude oil produces about a US\$17 change in the

price of HDPE for rotomoulding.

Concerning the United States situation, he noted that exploiting shales for natural gas is having a significant impact on the fuel gas supply picture. On feedstocks, the US is finding growing advantages in cracking ethane rather than naphtha.

Smith identified China as a significant growth point for rotomoulding. In 1994 there were 30 Chinese rotomoulding companies; by 2004 this had increased to over 700, and continued expansion in the market by around 10% per annum is expected.

Looking to PE market prospects for 2011, and forward to 2015, Smith predicted "a relatively tight market again, with no way for prices to go but up." Nevertheless, PE consumption for rotomoulding is expected to grow gradually in Europe. In the European commodity plastics business, said Smith, profits are made at the steam cracking stage, not in polymerisation.

'Evolve' – Driving efficiency and cycle time reduction

Aldo Quarantino, Matrix Polymers' technical director, described the advantages for rotomoulders of a new material formulation designed to reduce both cycle time and heating gas consumption, with a view to boosting production without compromising product quality.

"Evolve" works by reducing the surface energy and hence incidence of bubbles forming in the PE melt during the sintering phase of processing, without adverse effects on the viscosity and

rheology of the melt. With quality improvements in the finished parts through the elimination of pinhole faults, productivity is improved with a lower reject rate.

In laboratory tests, Quarantino reported a reduction in cycle time of around 15%, gas consumption reduced by ~10-20% (and hence reduced carbon dioxide emissions), and no adverse effect on mechanical properties (e.g. density and impact strength).

Evolve testing is being rolled out to the industrial scale by Valrom of Romania, a prominent supplier of water, gas and sewage systems. Valrom rotomoulds tanks in PE for water and oil storage, sewage collection, and system inspection applications.

Product development for shot weight reduction

James Seward, technical engineer with Matrix Polymers, showcased new grades of material developed specifically to reduce shot weights. A stiffer compounded foam material and a high-densi-



493K's Gareth McDowell (left) and Nick Henwood: Refining cooling control for rotomoulding

ty "Super-Linear" material were cited as demonstrating Matrix's "pushing material boundaries, giving the customer better properties while saving money by reductions in shot weight."

Cooling – 'The final frontier'

Dr Nick Henwood and Dr Gareth McDowell of 493K highlighted a new device to help rotomoulders control, regulate and measure key parameters of the cooling phase of the process.

Managing director McDowell explained: "Cooling is the single most variable factor in the entire rotomoulding process. Often,

when there are quality issues, especially with dimensional tolerances, we are inclined to immediately blame the material, the operators or the mould release agents.

"But analysis often proves that the problems have been caused by small shifts in ambient external air temperature. Cooling in rotomoulding uses a constantly changing cooling medium, since the temperature of the ambient air is variable.

"Currently, the moulder has only three alternatives to manage the issue: still air cooling (usually so slow as to be impractical); forced air cooling (usually only one setting is avail-

able, and the cooling rate depends completely on prevailing ambient conditions); or water spray (usually far too violent to be of any use, especially if dimensional stability is an issue). What is missing is any real-time control, for which a feedback loop is required."

At the Matrix seminar, 493K demonstrated real-time cooling control on a standard rotomoulding machine, using feedback from the company's K-Paq temperature measurement device.

Real-time measurements monitored the crystallisation of PE, showing that it is possible to cool very rapidly without causing the deformation and other problems associated with uneven cooling. The K-Paq system was said to be straightforward, requiring the minimum of additional equipment, and capable of easily retrofitting.

McDowell concluded: "The demonstration highlighted key issues surrounding cooling and dimensional control, and the assessment offered the benefit of significant technical detail."

Lower your carbon footprint with Econyl TS

100% Recycled Nylon
100% Prime Properties
One Supplier

AQUAFIL 



Post-consumer nylon waste regenerated into prime polymer
Label your product with UL environmental accreditation
Innovation from the only producer of this material in Europe

 Visit us on Stand 43



UK: 01925 750320
Ireland: 00 353 1 801 4050

ULTRA POLYMERS

www.ultrapolymers.co.uk

 **Enter now and be a winner!**
For full details go to www.plasticsawards.com