

Targeting the medical sector

The recent K show concluded in Düsseldorf saw machinery companies giving special focus to injection moulding machines for medical/pharmaceutical parts. They will come together again at the upcoming Medtec show in Stuttgart in March

Rather than simply promoting how fast or how accurate the machines are, several machinery makers have categorised their wares according to applications. At the K show in 2010, visitors could zoom in on machines for automotives, packaging or electronics. Medical application was an area that stood out in some booths.



Engel demonstrates the production of Petri dishes

Of the 20 machines Austria's **Engel** displayed at K, two were for medical injection moulding. The fully-electric, fully-automatic emotion 1340/280T was making polystyrene Petri dishes at a cycle time of less than 4.5 seconds. Using an 8 + 8 -cavity mould (for covers and bases) supplied by Plasticsud of France, the machine can reach production cycles of 16,000 dishes per hour, which Engel said is 25% more than could be attained using hydraulic machines. This machine will again be on show in Stuttgart.

Designed with encapsulated drives, sealed joints, smooth surfaces and an enclosed barrel, this machine can be used in a clean room. Engel's automation partner Hekuma provided an automated system to remove the parts in pairs, fit covers and bases together, stack finished dishes, then pack them into tubular bags.

As a result of the high regulatory standards required for medical moulding, Engel says it set up a special business unit

just for this segment. It has its own clean room at its headquarters in Schwertberg, which houses several test machines. The company has also tied up with partners to provide a complete medical solution to customers, including automation, moulds and clean room technologies.

The complete system

Already a recognised name in the medical moulding industry, **Arburg** is ramping up its capabilities to meet increasing demand in this area. After K, where a 1,500-kN electric Allrounder 520A was demonstrating the production of syringe barrels, the Lossburg-based company will exhibit in Stuttgart a 600-kN electric Allrounder 370A in a modular clean room set-up.

At Stuttgart, Arburg's machine will produce PP dosage chambers using a 2-cavity mould by Rittinghaus in a cycle time of 6.5 seconds. Parts are sorted and transferred to a docked clean room via an encapsulated conveyor belt. The ISO 6-7 clean room will also have an air ioniser positioned above the clamping unit and use FDA/NDF approved lubricants. The injection moulding machine has abrasion and scratch-resistant housing with powder-coated components for easy cleaning and maintenance. Water-cooled motors are used for the servo-electric drive axes for less air turbulence.



Arburg equips the Allrounder 370 A machine with a clean room module

Besides supplying the machines, Arburg also helps customers plan and implement turnkey projects.

At the K show, **Krauss-Maffei** introduced a system that promises to manufacture sterile parts according to GMP Class A standards. On display was the EX CleanForm manufacturing cell which comprised an all-electric EX 160-750 injection moulding machine producing syringe barrels using a 48-cavity mould and 6-axis KR16 robot. Parts made using this system need not undergo post-mould sterilisation and can be packaged straightaway, saving processors up to 25% in manufacturing costs.

A "clean room" zone is created by way of clean room walls and machine housing. An encapsulated lubrication system supplies the pivot points of the Z toggle and prevents leakage. The servo drives are also hermetically enclosed and cooled using water, further cutting down particle and thermal emissions from machine parts. The robot used to remove finished parts is located within the "clean room" zone and all surfaces are smooth and glossy for easy cleaning, even with harsh cleaning agents and disinfectants.



Netstal's Elion 1750 machine features encapsulated and water-cooled electric motors and energy-saving mechanics

Krauss-Maffei subsidiary **Netstal** will be exhibiting the Elion 1750 all-electric injection moulding machine at Medtec. Also producing syringe needle protectors, the Swiss company will use a 48-cavity mould by Kebo, from Switzerland.

The Elion machine has a cycle time of 7 seconds and also features encapsulated and water-cooled motors. In addition, this machine has an energy-saving system that transfers energy stored during braking to the power circuit, and can save up to 70% in energy consumption, says Netstal.

Small is beautiful

Some parts used in medical devices can be minuscule, like the 3.5 mm diameter control knobs for hearing aids **Sumitomo (SHI) Demag** will be demonstrating at Medtec. The IntElect 50-45, with a clamping force of 500 kN, will produce the 10 mg POM parts in a cycle time of 10 seconds.

Injection Moulding



The IntElect injection moulding machine by Sumitomo (SHI) Demag tackles micro POM parts for hearing aid devices

The machine on display will have a 14 mm screw for plasticisation of small material volumes, just 280 mg in this case. It comes with a patented activeLock back flow valve which briefly seals the melt runners of the back flow lock using a brief and jerky rotation opposite to the direction of plasticisation. This means that a very small

remaining cushion will remain before the screw over a large number of cycles, leading to improved process consistency and thus, high-quality parts.

Sumitomo (SHI) Demag's machine will be operating as part of a production cell. The cell comes with a four-cavity cold runner mould with a tunnel gate designed by Stemm AG of Switzerland, the ISO 7 clean room cabin and laminar flow unit above the machine made by Max Petek Reinraumtechnik of Germany, and the automation solution from Mai of Germany is integrated with a six-axis robot from Yaskawa Europe.

Also showing off micro parts is **Wittmann Battenfeld**. A POM medical clamp weighing just 3 mg will be made using a 4-cavity mould from Microsystems UK, in a cycle time of 4 seconds on the MicroPower 15/7.5 machine. This is an all-electric injection moulding machine for micro-mould-

ing and is available for clamping forces between 50 and 150 kN. It has a two-step injection unit — consisting of a screw and a plunger — for shot volumes from 0.05 to 3 cm³. Thanks to thermally homogeneous melt, high quality parts can be achieved with shorter cycle times, and thus better energy and cost efficiency — up to 50%, claims Wittmann Battenfeld.

The injection moulding machine is equipped with a W8VS2 Wittmann robot which removes the finished parts to a camera for inspection. These are then separated according to cavities and stacked. Together, the system and clean room module pass Class 6 clean room ISO 14644-1 standards.

Medtec Europe takes place at the Messe Stuttgart in Germany, 22 – 24 March 2011. More information at www.medteceurope.com



Wittmann Battenfeld goes micro