

## Engel's new Processing Department: A lot of benefits to meet customer's needs

Engel goes beyond supplying molding machinery – with processing technology, services and expertise available to help customers find the best molding solution possible.

### Processing Department in new location

>> The Engel Canada Processing Department recently settled into their new home, an area recently created during the latest expansion of the main plant in Guelph. These new facilities, which total 2200 square feet in size, are shared with the CSD training group.

After residing in the Automation facility for many years, this move has brought the Processing Department physically closer to the Sales Department, it's primary "customer".

The new facilities are equipped with a completely new line of five dedicated lab machines, as well as three machine which are used for customer training by the CSD department. These machines are equipped with countless options, making sure they are well prepared for the requirements of any possible customer evaluation.

### Technology focussed

The line-up of new machines includes all drive concepts currently available from Engel for injection molding machines: fully electric, hybrid (electric screw drive) and fully hydraulic. The availability of all three machine types would allow for a customer mold to be evaluated, on each machine, to investigate potential energy savings and/or accuracy, depending on the drive concept. Since Engel offers all three major concepts, the most suitable can be chosen after the evaluation.

To provide an even greater benefit to our customers, our lab machines have also been



equipped with a number of Engel technology solutions. Technologies that are supported in our lab, for testing and customer demonstration include: WATERMELT, X-MELT, GASMELT, PIM (Powder Injection Molding), MuCell®, LSR (liquid silicone rubber) and ELAST.

### Fully committed to customer support

Along with the new facility and state of the art injection molding equipment comes the absolute commitment to fully serve our customers as best as possible. In order to achieve this, the Processing department offers a variety of services to our customers, which include:

Machine	Drive	Process
E-MOTION 440/165 US	all-electric	X-MELT
TL 650/150 US	hybrid electric	MuCell
TL 1050/200 US	hydraulic	WATERMELT
TL 80/40 US	hydraulic	LIM
ELAST M80 US	hydraulic	Rubber

Machines currently available in our Processing/Training lab.

**Machine run-offs** are the most commonly performed task of the department. Performing a machine run-off prior to shipment ensures that the customer gets a fully debugged machine or production cell, according to his specifications and/or performing to the guarantees given from Engel.

If necessary, the machines will be fine tuned to the material and process used to ensure peak machine performance in regards to repeatability, cycle time, stable process and minimum energy consumption. A machine run-off is also a perfect opportunity for the customer to get familiar with the new equipment and possible special features of it. Engel's process technicians will gladly answer any questions that might come up during the run-off in regards to the equipment/process and injection molding in general. Information about these new technologies can also be discussed.

**Machine evaluations** are meant to vividly demonstrate the special features and many advantages of Engel injection molding machines. Evaluations additionally focus on the potential for improvements to the customer's process settings and potential improvements to their equipment (e.g. molds) if possible and feasible.

**Mold evaluations** are another growing field of service processing offers. During these mold checks, alignment of the parting lines are controlled with pressure sensitive film, filling studies are performed to check if the runner system is balanced as well as the mold movement (opening in the split line) during the filling and hold phase is measured to detect possible design deficiencies or clamp tonnage miscalculations.

**Material testing** can be performed with a large variety of screws, which have been specially designed for different materials. If a high recovery rate, perfect color mixing or a superior wear life is required, we establish the necessary screw geometry and check-ring assembly to meet the specified requirements.

### Technology demonstration

Engel's ongoing strong commitment to technological leadership leads to another key task being offered by Processing – **technology demonstrations**.

At the K2001 show in Duesseldorf, Engel introduced the WATERMELT technology, the next step in fluid injection (e.g. gas-assist), to the injection molding community. To bring this technology to the North American market, Engel Canada has obtained it's own mold and water unit for demonstrations and R&D projects. The mold and the water unit are scheduled to arrive in our Guelph facility at the end of February 2003. The system will then be available to our customers, for trials and technology demonstrations. The most obvious advantage of the WATERMELT process is the ability to reduce cooling times by 50%, in comparison to gas assist.

Another new exciting injection molding technology that will be available at the processing lab very shortly is X-MELT (Expansion Molding). Providing extremely high melt front speeds, this process is perfectly suited for ultra thin-walled engineering parts.



**WATERMELT:** Three water injectors are required for the injection molding of this branched and angled coolant pipe (25 mm outer diameter and 3-4 mm wall thickness) in PA 66 with 30% w/w glass fibers.

### Process Engineering support

Machine/process/technology/ design support is another major part of the services being offered by Processing. Based on a sample part or drawing of the product, the processing department specifies the necessary machine size, special equipment (if necessary e.g. special screw design, specific software program), cycle time, best technology to produce the part and basic mold specifications/design. If the part is suitable for a special technology, (e.g. WATERMELT, Gas-Assist, MuCell®), we offer our recommendation regarding necessary (design) changes that need to be made to the existing part design, as well as the mold, to successfully transfer an existing production process/method to a more technically feasible and thus more economic process. If deemed necessary, proof of principle testing can be done with prototype molds, to gather additional information and confirmation prior to production cell building.

- The Engel Processing department will work along-side the customer from early part concept stages to the fully installed production cell. <<



A view into our new Processing/Training lab in Guelph.

### Growth and Commitment

>> In the early years, Engel Automation was located in the main Guelph production facility, with approximately 2,000 square feet of production space. This space was quickly outgrown, and increased to 5,000 square feet. In 1994 Engel purchased an adjacent 30,000 square foot building in which they created an independent manufacturing facility for robots. Departments from machining, purchasing and assembly to production control, engineering, sales and service, are focused strictly on automation, and are located together in this facility. The number of employees has also grown from three to the current number of 60.

Being located within the same physical area leads to close working relationships between departments. Defining all details of the customer's needs upfront, at the quoting stage, leads to a smooth flow through development and manufacturing. Constant interaction between departments keeps projects running smoothly from sales to engineering, machining to assembly, and into test and integration.

Engel Automation North America provides a full product mix, allowing us to meet most automation requirements, from simple pick-and-place to complex fully automated production cells.

Our line of ERTLi robots is used for simple pick and place applications and is fully integrated into our tiebarless machines (ENGEL TIEBARLESS and VICTORY lines). The ERTLi

Engel's Robotics & Automation Division was set-up in North America over 10 years ago, as a Global Division to supply the North American market with a full line of robots and automation equipment. Surpassing total production of over 1200 robots, and with a 25 to 30 percent growth rate in the last five years, we have only begun.



### Endless possibilities

When it comes to automating an injection molding machine, the possibilities are endless. In such competitive times, our customers are looking more and more to upstream and/or downstream processing capabilities to allow them to deliver more value to their customers. Options ranging from a simple sprue picker for runner separation, to a full servo robot removing both sprues and parts, including a degating station and orienting finished parts in a boxing system are available. We can also go further, to designing a full turnkey automated cell using complex feeding systems for inserting applications, vision or laser inspection and full finished part orientation, stacking and packaging. The resources are in place to help design automation systems to meet any needs.

We have a very knowledgeable staff of integrators in our Systems Integration department. They are on hand to help with everything from the design of integrated systems, to the in-house integration and testing of the cell. They also provide full phone support, after system installation, providing assistance with any questions or concerns.

One large benefit we offer customers is the full cell runoffs that take place at our facilities (either the Automation facility itself, or in our main plant). Runoffs will include the machine, robot, and any downstream equipment required by the customer. It is all fully assembled, integrated and tested, giving an added sense of security before the system reaches the customers' plant floor. <<

control and pushbuttons are an intrical part of the machine control and the robot functions within the extended rear guarding along with an integrated conveyor belt. This robot has a single servo horizontal axis and 2 pneumatic axes, (one axis for strip stroke and one axis for vertical stroke).

## Automation made by Engel

A high-speed side entry robot is available for the removal of thin wall parts. The ERS (Speedy) can be mounted to any brand of Injection Molding Machine with fast cycle times. The ERS has one high speed linear axis mounted at machine centerline for part removal, and can be combined with any other robot for secondary operations such as handing off parts for packaging.

Engel's main robot product line is our ERC. The line comes in 2 configurations. First is the low cost ERC-EA asynchronous robot. These models have 3 linear axes that are controlled by AC motors. Our top of the line ERC-E/EH have 3 linear axis that are controlled by servo motors and can run up to six axis through the option of an A, B, C-rotary combination.

We also supply specific robots for our vertical rotary table machines (ENGEL INSERT line). The ERV is used for insert molding. A single servo horizontal axis with 2 pneumatically controlled vertical axes is utilized for part removal and insert placement. This robot can be interfaced through the machine or configured for an SPI interface for non Engel Machines.

### Automation Solutions

Customers often require solutions to specific problems. Here, the robots were mounted over the non-operator tiebar for clamp end deposit. The mirror image design of the X and Y-axes provides a lower height clearance and allows larger parts to be removed. Having all the parts deposited at the end of the clamp gives customers better part flow from machine to machine, and cuts down the real estate lost between machines.



Engel at NPE 2003, Chicago/IL, June 23 - 26. Engel at NPE 2003, Chicago/IL, June 23 - 26. Engel at NPE 2003, Chicago/IL



## Customer-oriented Injection Molding and Automation

>> An extensive display of molding machinery, automation and technologies will be on display in the Engel booth at the forthcoming NPE 2003 show.

Included will be machines from the all-electric tiebarless ENGEL E-MOTION line. These machines are equipped with ENGEL ERC servo robots in both standard and asynchronous executions, and will display LIM and the new X-MELT (expansion molding) technologies. The E-MOTION line, currently with machines from 60 to 200 US tons, is expanding to include machines of 250, 300 and 400 US tons. The ENGEL CLASSIC 600 Speed US (toggle machine in high speed execution) introduces the new line of CLASSIC US, CLASSIC Power US and CLASSIC Speed US to the North American market. The CLASSIC Speed US has all the features and benefits of the CLASSIC Power US (electric screw drive - providing parallel screw recovery, energy savings and

noise reduction), with the addition of accumulator for increased injection rate. A sampling from our two-platen ENGEL DUO machine line will be displayed, including the 720 US ton machine (currently the smallest DUO machine) and our 1000 US ton, wide platen machine. Both of these machines will be equipped with our new ERC E-Series servo robots.

Along with the new X-MELT process, designed for ultra thin-walled, high-speed and micromolding applications, WATERMELT technology is also being introduced. This technology essentially uses water to reduce cooling time, and is ideally suited to larger diameter, hollow-core, geometric shapes.

ENGEL CSD (Customer Service Division) will be on hand to discuss items including Tel-eservice, EMS (Engel Monitoring System) and Customer Training. Our Technology and College Center, too, will have staff available for discussion on any of Engel's wide range of process technologies, or the ENGEL College program. <<

ENGEL at NPE 2003: South Hall, Booth # S-1685			
Machine Model	Robot & Automation	Process	Part
E-MOTION 60 US	ERC 23	X-MELT	DVD linear gear
E-MOTION 440/100 US	N/A	LIM	Connector seal
E-MOTION 740/200 US	ERC 33-1EA ATS coaster automation		Coaster
INSERT 90V US	ERC 23-1E		Electrical connector
VICTORY 150 US	ERC 43-1E	WATERMELT	Cooling water manifold
DUO 720 US	ERC 64-1E		Manifold inlet
DUO 1000 WP US	ERC 84-0E	Long glass fiber & injection compression	Door panel
TL 300 US - 2 color	ER-TLi 71		Reflective disk
CLASSIC 600 US Speed	ERS (Speedy)		Food container
ELAST 50 VTL	ERV 21	Rubber	End cap
Automation Cell	ERC 63-E, ER-TLi 51, ER-A 3 x 3		