

## European teamwork meets medical automation

**T**ech Group Ireland, the first European venture of The Tech Group Inc. of Scottsdale, AZ, went online in June 1998 and has been steadily growing since. One of the company's leading specialties is high-end, highly demanding molding applications, primarily in the medical and electronics fields. The company launched the venture in Ireland to support several U.S. medical and high-tech companies that have opened facilities there, and as a platform from which they could expand further in Europe.

The Irish operation, located near Dublin's international airport, will provide \$20 million-plus of Tech

Group Inc.'s more than \$200 million revenue in its current fiscal year. The Irish economy is the strongest in the EU at this point, and one of the principal reasons is the high-tech companies, primarily from the U.S., that have set up European headquarters and/or manufacturing and distribution operations in Ireland over the past few years.

Tech Group Ireland's managing director, David Moffitt, is also the minority owner. Moffitt says combining his local contacts with Tech Group's customer and supplier network allowed the operation to get up and running quickly. In turn, two molding machine makers (Demag and Netstal) and an automation provider (Hekuma) brought in during the startup have aug-



**Figure 1.** Shown here is a fully automated production system for Johnson & Johnson's Gemini Wells blood analysis system.

mented that network. Moffitt says the automation systems have played a particularly important role.

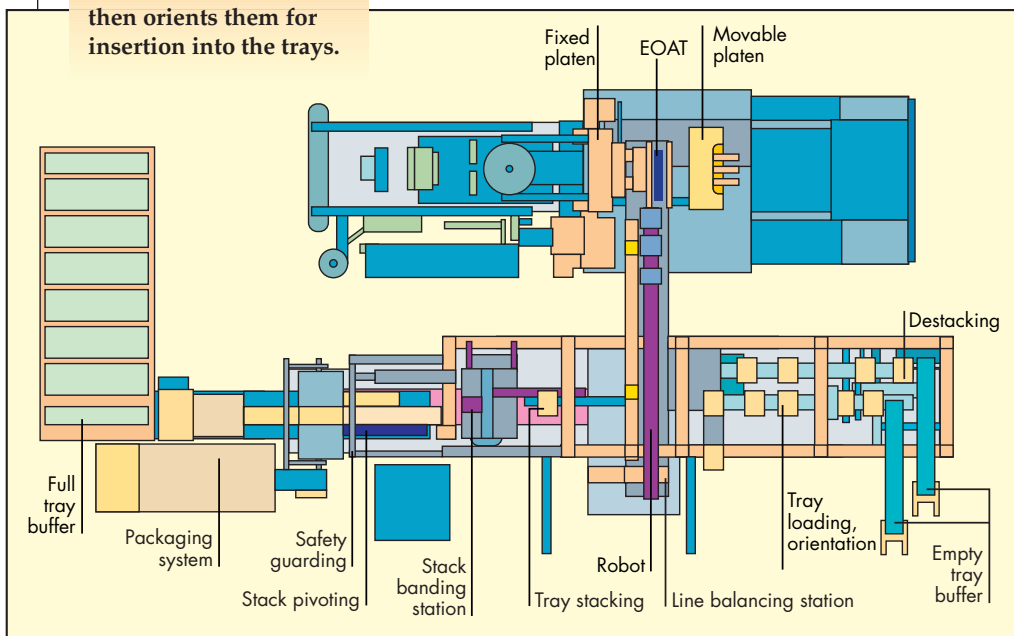
### START WITH AUTOMATED CELLS

Among Tech Group's first applications at the Irish operation was a line of ink cartridges for a leading maker of computer printers. Specifications for the cartridges are very complex. Two highly critical parts are molded as single shots in separate machines, assembled, packed, and shipped to the OEM for high-speed filling.

Because of the high quality demanded by subsequent processing operations and the way the cartridge is used, parts are produced in a climate-controlled white room. The company also has a Class 100,000 cleanroom and is currently commissioning a Class 10,000 space.

The success of this cartridge application hinged mainly on the successful integration of molding machine and automation equipment. Tech Group trialed Demag and Netstal machines, ultimately choosing both to do the job. And it partnered with Hekuma to supply the automation required to complete construction of the cell. Now the company runs six production cells, three of each machine type, all using Hekuma systems. This project set the stage for the next application Tech Group had to tackle in Ireland.

**Figure 2.** The Hekuma robot pulls wells from the mold and places them in a buffer that then orients them for insertion into the trays.



### NEW CLEANROOM

We noted that Tech Group was commissioning a Class 10,000 cleanroom. Among



**Figure 3. Tech Group Ireland's Demag and Netstal systems are each integrated with custom automation by Hekuma.**

the earliest applications produced in the new cleanroom will be a sophisticated blood diagnostic system designed and marketed by Johnson & Johnson. Called Gemini Wells, the system consists of a tray, into which are seated 96 individually molded wells. Each well, in application, will contain a reagent that interacts with blood samples for analysis.

The materials are HIPS and a filled PS. The production cell that Tech Group specified to mold the wells and assemble them into trays consists of a 96-cavity hot runner mold from Otto Männer of Germany, a 100-ton Netstal Synergy machine, and an automation system from Hekuma (Figures 1 and 2, p. 88).

The process works like this: Stacks of separately produced trays are fed into the automation system, which parallels the linear axis of the molding machine. Hekuma's high-speed, side-entry robot takes the wells from the mold using end-of-arm tooling equipped with floating centering devices for positive connection. The robot itself is completely sealed for use inside the cleanroom.

Because Johnson & Johnson specified the tool be designed to allow individual cavity shutoff, the possibility exists that the press could produce less than the required 96 wells for each tray. Hekuma therefore designed a buffer, or collecting device, into the system to ensure that at least 96 wells would always be available.

The side-entry robot takes the wells from the mold and places them into the line balancing station, as the buffer is called. An inventory of at least four shots of wells is collected and oriented here before placement in a tray. This may sound complicated, but Hekuma's solution is what design engineers call elegant simplicity: The count is balanced from shot to shot, the overall process is very fast, and cycle time is not impacted.

To synchronize with the molding cycle, empty trays enter in two lines. Filled trays exit in one line and are stacked using an empty tray as a protective cap. The stacks are then automatically banded and wrapped in stretch polypropylene film.

### QUALITY CONTROL

There are two easily accessed quality control stations built into the system: One takes a full shot of wells from the mold, and the second takes a filled tray. Hekuma's dual sensor system performs quality checks, including emptiness of incoming trays, tray orientation, and fullness of outgoing trays. Rejected trays are automatically ejected into a clean holding area. The dual sensors ensure that a failed sensor does not stop the system. If one half of a sensor pair fails, the oth-

er continues to function and a substitution can be made when convenient.

The initial specification called for sub-5-second cycles for a complete 96-well tray, including .4 second of mold open time. Since the full system was initialized and debugged on Hekuma's manufacturing floor, Tech Group achieved the desired performance level from the start. Moffitt says the system is so well optimized that only a few tenths of a second could be shaved from the cycle during Johnson & Johnson's yearlong validation testing.

Tech Group's modern facility outside Dublin, which is ISO 9002 and CGMP compliant, now covers 40,000 sq ft and contains 22 injection machines ranging from 80 to 350 tons (Figure 3). There is space for 10 more, plus the building is expandable to 70,000 sq ft, which would allow up to 60 presses. There are also plans afoot to expand in Europe either through acquisition or via greenfield development.—Robert Neilley

### Contact information

Tech Group Ireland  
Dublin, Ireland  
David Moffitt  
Phone: +353 (1) 885 9700  
Fax: +353 (1) 885 9701  
Web: [www.techgrp.com](http://www.techgrp.com)  
E-mail: [davidmoffitt@techgrp.com](mailto:davidmoffitt@techgrp.com)

Hekuma GmbH  
Eching, Germany  
Kurt Knoepfler  
Phone: +49 (8165) 633 0  
Fax: +49 (8165) 633 55  
E-mail: [hekuma@compuserve.com](mailto:hekuma@compuserve.com)  
Circle 245 / IMM Infolink