AGILENT TECHNOLOGIES

Speeding the Manufacture of Bio Tech Research Tools

As the pressures of timely innovation intensify in the Life Sciences industry, Agilent meets the demand for sophisticated tools to keep its customers at the forefront of biotechnology research. Using Camstar's products, Agilent has built a highly automated factory to deliver sophisticated DNA Microarrays at unparalleled speeds.

THE CHALLENGE:
Customize a Complex Product While Accelerating Manufacturing

Agilent entered the DNA microarray market to build highly configurable products in record time. The company wanted to track the production of each array and provide its customers with a detailed record of the process. This high level service helps speed DNA research, and improve the reliability of research results for their customers. Len Esparza, Infrastructure Manager for Agilent, says, "We wanted to merge the concepts of high volume and high customization manufacturing. We knew that would require complex production operations. We had to be sure the system we chose could keep up with our notions of what our business should be."

Creating Specialized DNA Microarrays to Speed Research and Discovery

Agilent's DNA microarrays are 1" x 3" glass slides holding thousands of spatially segregated DNA compounds. These arrays enable scientists to measure interactions within multiple experiments, and allow reseachers to analyze the functions of many genes at a time. Using Agilent arrays, bioresearch and pharmaceutical customers can run up to 60,000 experiments in parallel. Customers can design unique arrays, specifying the exact length, sequence and location of each DNA segment. This, says Esparza, "has a proportional effect on increasing the pace and decreasing the cost of discovery, which is really what our customers are after." In order to meet these demands, Agilent wanted to develop an automated design, order and manufacturing process to provide custom arrays faster than any other manufacturer.

Tracking the Manufacturing Process and Increasing Volume

Given the specialized nature of the arrays and the daunting volume of product specifications, each array must be carefully tracked—product reliability is paramount and room for error is nil. The company must be able to track the more than 100-step manufacturing process down to the last gene and provide customers with a complete "defect map" to avoid inaccurate experiment results.

The custom arrays Agilent delivers are often highly proprietary so the business also demanded an automated system that could guarantee client information remained discreet and protected. "The detailed tracking capability of InSiteLive really pays off and ensures that this very proprietary information gets packaged and delivered to the right customer with the right arrays," says Esparza.

Agilent realized that creating these custom arrays, tracking them with any degree of certainty and manufacturing them at high volume required a robust MES that is at once controlled, flexible and far-reaching.

> For Agilent, InSiteLive is critical to its business. "We have already realized that without something like this, the whole concept of a customized, highly-configurable product made on demand and delivered in a quick-turn fashion just would not happen."
>
> –Len Esparza
> Infrastructure Manager
> Agilent Technologies, Inc.

Agilent's facilities are almost entirely automated with InSiteLive shaving production time down to only 5 days.

Camstar's Benefits are Felt Across the Enterprise

- **Control:** For highly customized products and changes on-the-fly
- **Visibility:** Enterprise-wide access to up-to-the-minute data for quick process improvement and forecasting
- **Speed:** For improved yield, increased volume and faster time-to-market

SOLUTION OVERVIEW

Applications
- **MES:** InSiteLive
- **ERP:** SAP
- Custom Order Mgt.
- Custom Product Design

Number of Plants
- 4 U.S. sites

System Specs
- Windows NT OS
- Client/Server Configuration
- Oracle Database

THE SOLUTION:
A Highly Flexible MES Working With Other Systems

Agilent was using SAP for business operations, and sought a solution in manufacturing that could link to SAP to provide the tracking data customers needed and live production status Agilent employees wanted. "In order to do this quick-turn production of custom arrays," he says, "we would need some pretty sophisticated information tracking systems that would link to our existing ERP."

Building a Bridge Between SAP and Camstar's InSiteLive MES

Agilent envisioned an integrated solution that would speed production—from initial order to final shipment. Connected with SAP and Agilent's custom applications, "InSiteLive permeates the entire operation from the point where we take an order to the point where we actually ship the array," explains Esparza. Recounting the decision process, he says, "We knew SAP could do a limited amount for us. We looked to InSiteLive to do the rest, and defined how the two would touch."

Improvements From the Micro to the Macro Level

Agilent can now extract valuable live data from SAP and InSiteLive to inform a wide range of business decisions. The system delivers real-time production details to everyone who needs them: from corporate finance assessing impacts on manufacturing, to a technician analyzing the quality of a specific slide on an array, to a sales person verifying that a shipment has been made. This not only improves overall productivity, the high degree of control empowers Agilent to evolve processes quickly and effectively as the business grows. At its core, InSiteLive uses the minute details of manufacturing to inform business decisions, sharpen processes, and improve products and service.

In addition to faster production and access to live information, the automation InSiteLive provides is critical to customers. In order to rely on their test results customers need the very specific manufacturing quality and process data that Agilent sends with each array. "The name of the game in manufacturing is automation. Often this has meant only factory machinery. But the benefit of making a product in record time is lost if the supporting design, ordering, and delivery processes are stuck in the past. I suppose this job can be done with 500 more people to manage bringing arrays and data together to be presented to the customer," Esparza laughs, "but that's no service to the customer as it would obviously make the product cost prohibitive."

THE PAY OFF:
An Automated, Tracked Process for Arrays in One Tenth the Time

Today InSiteLive runs 90% of the processes in Agilent's Santa Clara, CA manufacturing plant (the other 10% are being automated). To date, an additional plant in Little Falls is connected to the Santa Clara operation via InSiteLive. Other sites in Delaware and Palo Alto, CA are coming on line as Agilent refines its processes and works towards a single, interconnected manufacturing system to further improve customer services and productivity.

In the meantime, Agilent continues to exceed its goal to produce custom arrays in record time. While the industry standard turnaround for a custom array is two months, Agilent can have them produced and delivered in as few as five days. Esparza is pleased with the results: "That five-day figure is pretty phenomenal. It's astounding...and it couldn't have been done without the business information system of which InSiteLive is a big piece."

CAMSTAR