

# THE MANUFACTURER

PROMOTING BEST PRACTICES IN MANUFACTURING

www.themanufacturer.com \$5.00 JUNE 2004 Vol 4 Issue 6

## The *training* game

How it keeps jobs and  
saves business

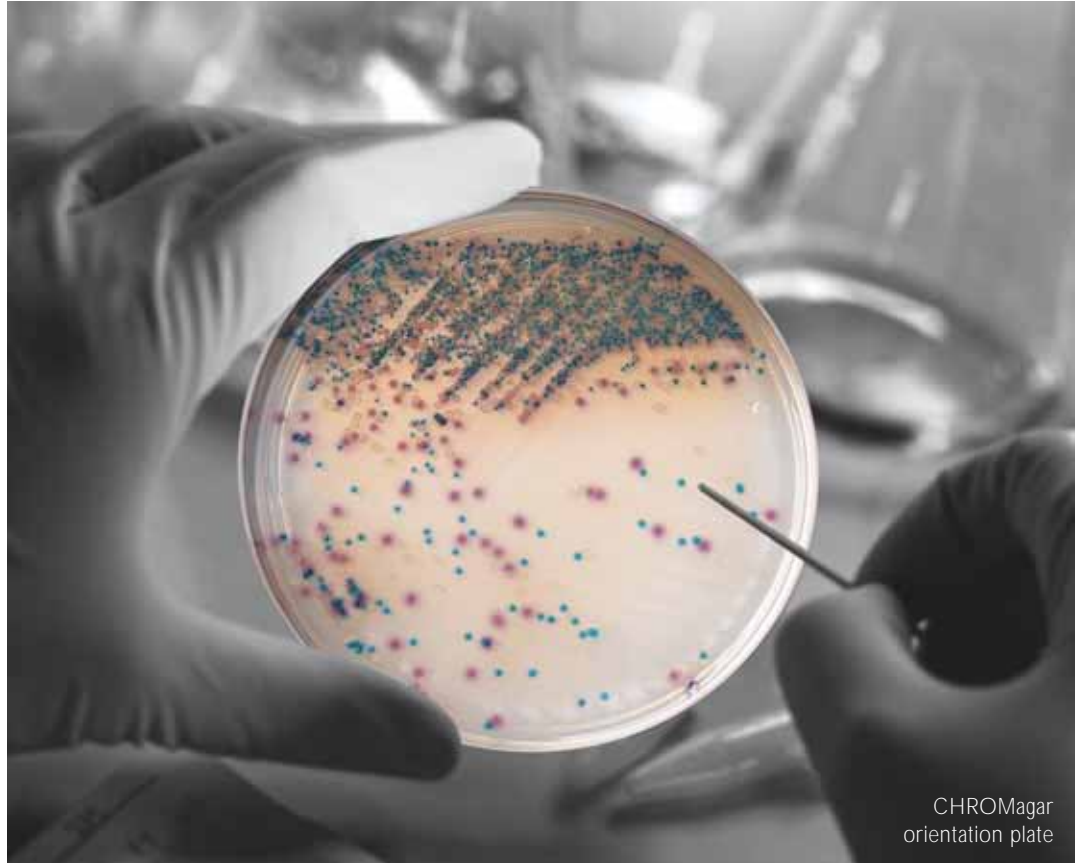
### Interview

Ron Huston, president and  
CEO of Advanced Circuits

### Special Report

The state of the  
automotive industry

**PLUS:** BD DIAGNOSTIC SYSTEMS EXPERIMENTS WITH SIX SIGMA AND LEAN



CHROMagar  
orientation plate

# Managing growth

*BD Diagnostic Systems is experimenting with a Six Sigma and Lean combination. Bruce Roed tells Jennifer Monroe that the result is proving to be just what the doctor ordered*

## Kaufman Global

Kaufman Global specializes in the accelerated implementation of strategic initiatives for clients globally. First to develop and market this niche service, Kaufman Global has earned its reputation as “different” from the strategically focused consultants in the industry. Combining proven methods such as Lean, Six Sigma and Office Kaizen with its unique approach to implementation, Kaufman Global is helping companies create and sustain significant, measurable advances.

It may be a stretch to say BD Diagnostic Systems has found a cure for all manufacturing operations ills, but the company’s combination of Six Sigma and Lean principles, as well as a number of other continuous improvement efforts, is opening up many opportunities for overall business growth.

“The integration of those really allows you to get greater benefit by putting the right resources on the right problems,” explains Bruce Roed, vice president of operations. “We describe Lean as high touch, low tech, and Six Sigma as low touch, high tech. It is really melding together and the corporation is using it globally to drive continuous improvement.”

Based in Baltimore, MD, BD Diagnostics Systems is part of BD (Becton Dickinson and Company) a medical technology company that serves healthcare institutions, life science researchers, clinical laboratories, industry, and the general public. It was founded as a medical supply company by Maxwell W. Becton and Fairleigh S.

Dickinson in 1897. Nearly a decade later, the company moved to New Jersey and was incorporated. That was followed by the purchase of its first US plant, located in East Rutherford, NJ, which was dedicated to the manufacture of thermometers, hypodermic needles, and syringes. BD’s history of manufacturing innovation began there, as the company designed most of its own machinery and manufacturing processes.

As the company grew, it would add to its product mix, ACE bandages, the first disposable blood donor kit for the American Red Cross, and its own BDVacutainer blood collection system. In 1948, control of the company passed to the founders’ sons, who eventually took BD public in 1962. New products came through internal development, as well as acquisitions, and BD grew into a global corporation.

Today, BD manufactures and sells a broad range of medical supplies, devices, laboratory equipment, and diagnostic products and recorded \$4.5 billion in

---

sales in fiscal year 2003. As part of that success, BD Diagnostic Systems offers system solutions for collecting and transporting specimens; advanced instrumentation for quickly and accurately analyzing specimens; and traditional microbiology products.

BD Diagnostics Systems operates a plant-in-plant structure in Baltimore, with six product- or market-focused facilities there. Additionally it has US sites in Madison, WI, Grayson, GA, Wheatridge, CO, and Detroit, MI. Internationally, Diagnostic Systems also has facilities in Germany, Japan, and Mexico.

"Baltimore is the main site and is the feeder plant for finished products at remote sites," Roed says. "Each plant does something different."

For example, its factories in Germany and Japan are market specific and focus on products with a short shelf life.

Baltimore is the heart of BD Diagnostics Systems. There, five separate buildings house the company's different product lines, and each is run by a plant manager who is a member of that product's business team. "We produce more than 6,000 different catalog items," Roed notes. "We manufacture a wide array of products, from simple prepared plated media, to highly sophisticated automated instrumentation, all used to aid in the diagnosis of infectious disease."

Specifically, BD Diagnostic Systems makes chromogenic media for both clinical and industrial applications; sterile packs of bottles, swabs, and plated media; and its own innovative BD BBL GasPak systems. On the instrument side, it manufactures the BD Phoenix Automated Microbiology System for identification and susceptibility testing, the BD ProbeTec ET System, and the BD Viper Sample Processor. The latter, used with the BD ProbeTec System, automates the sample handling associated with high-volume testing. An industrial-grade robot performs pipetting transfers without the use of syringe pumps and tubing, reducing repetitive motions for lab technicians and decreasing errors.

BD Diagnostics' processes are as varied as the products the company manufactures. For its core microbiology business, it begins with raw materials, often dry ingredients that go into the prepared media and reagents. "That operation often begins with milling and blending of raw ingredients in an environmentally controlled environment," Roed says.

The company's core microbiology business tends to be high volume and highly automated with full in line manufacturing from filling to packaging, operating in a clean room environment. Other operations are much more varied from very unique low volume almost manually produced to highly technical and very automated manufacturing system operated in a clean room. In instrument manufacturing there is a lot of component assembly and work with a lot of vendors in terms of sub assemblies. All of the components however, are researched and designed by BD Diagnostics.

Keeping track of such a complex operational structure has been enhanced in recent years with the introduction of Six Sigma, SAP, and Lean. As it does with products, the Baltimore campus feeds what it learns to the remote sites. "We are using the same strategies for continuous improvement in all of the sites," Roed says.

Six Sigma was BD Diagnostics' first initiative and was focused

on technical projects. At the time, Roed was in a different position within the company. "We began to see some good results, but we hadn't made the jump to fully integrate Six Sigma into our operations business processes."

So three years ago, Roed and several of BD Operations leaders encouraged BD to look at rolling out Lean on a global basis. BD's focus was not on Kaizen, 5S, or the traditional lean manufacturing starting points. Instead, the company focused on leadership. "We wanted our plant managers to take control in leading their plants in continuous improvement," Roed explains. "We used an external consultant, Kaufman Global, and said, 'we wanted to learn to do this ourselves, but we needed some help.' We really like the leadership approach embodied in what Kaufman was showing us."

BD Diagnostics Systems built a process using Lean tools, and then incorporated Lean, Six Sigma, category management, and validation initiatives into its operations. "We decided to bring those four pillars together and they have become the cornerstone for continuous improvement for BD," he continues.

This integrated approach is proving more successful than considering only one set of tools. What once would have been considered prime for a Lean activity may now be recognized as a technical or statistical issue, and better suited for a Six Sigma approach. "I've come to really believe Six Sigma alone leaves you with a lot of wasted energy," Roed says, "and lean alone can bring about a great deal of frustration. Our plant is structured around that integration and we are always looking at what is the appropriate tool. When looking at value streams across the organization we can actually ask 'is this an activity better fixed by Lean or Six Sigma or a combination?'"

Actual improvements resulting from the initiatives have been both great and small. With a Lean Daily Management System, the focus is on how the business is doing on a daily basis, and how everyone is contributing to its success. "We are really redefining the role of the plant and plant staff around continuous improvement and continuous improvement activities," Roed says. "Each team has metrics it measures, and those roll up into the unit, which then rolls up to Diagnostics overall, and those eventually roll up into the Corporation. We are all linked together from the top to the shop floor."

"We are using the tools of Six Sigma and Lean to do validation activities," he continued. With these activities, both a Lean leader and a Six Sigma black belt work as key advisors to the company's many cross-functional blitz teams. On the greater side of the results, one blitz found a BD team eliminated an entire step in a process. "It had historically grown and was embedded in the way we scheduled," Roed says. "The team identified it as something we could eliminate. These are types of things we're finding. In some cases it's subtle and in some cases it's more obvious."

"I have no idea how many blitzes we're doing any more," Roed admits. "I can't keep up with all the activity and change. We translate all of that into business outcomes, looking at the hard savings. There has to be financial savings to pay for all of this. We're focused on getting the value from it."

Since its operations differ across product lines, so too have its lean efforts. One current project in its instrument plant is

incorporating the use of Kanbans with external vendors. "We're already doing it internally," Roed says. "We are operating under 'sell one, make one.'"

Designing its Kanbans relies upon forecasts linked to global demand. These are then integrated with its planning system, through which key suppliers are now starting to interact directly. "We have to do this very cautiously," Roed says of the effort. "Some vendors are asking us what took us so long while others are learning with us."

Even in its initial stages the move to Kanbans is showing positive results. Raw material inventories have been reduced more than 25 percent in the past two years and both space utilization and working capital have been improved. "We're really pretty pleased and we're getting great support [from the corporation] and our vendors to help us do this."

Value is not limited to manufacturing operations. Blitzes recently started in BD Diagnostics' distribution Center. "We're doing combined blitzes to see the flow into the truck," Roed says. "We're starting to look at lean value stream maps right from distribution. In one respect, the distribution center is just a big manufacturing operation. We are manufacturing shipments instead of products, so we can use the same tools and techniques. The whole approach to continuous improvement is being applied right there, and it goes in quite nicely."

Long term, BD Diagnostics Systems plans to use its continuous improvement successes at the front end as well. "We want to take it to order processing," Roed says. "Anything we can do at receiving, or in our operations we see as adding value to the business and taking cost out of the supply chain. That's where we're going now."

But this isn't the company's first foray into integrating planning and procurement with manufacturing. After two years of planning, BD Diagnostics Systems went live in 2002 with the full suite of SAP. "We moved everything into a common system for the different operating units here," Roed says. "Now we're all looking at the same data, and can share the same best practices. It was a huge learning process for the organization, and we've spent a lot of time how our business practices interact with it. They are not discreet functions any more."

Roed admitted the SAP implementation was not without its challenges. "The struggles at go live were there, but we're very happy with progress we've made in getting value from that system," he says. "It can be a very difficult transition but you gain tremendous power once you make that shift."

Of course, BD Diagnostics Systems has received enormous support at the corporate level for its efforts. In fact, the SAP implementation was part of a larger BD initiative. "We were not alone in this," Roed points out. "The corporation was going live globally."

Continuous improvement may be the cornerstone for BD Diagnostics Systems, but quality is its foundation. "BD's history has been built on quality," Roed says. "Mr. Becton and Mr. Dickinson founded the company to get a reliable and high quality supply of medical products. They believed they needed a better source. Quality is just a part of being a part of BD."

Specifically, quality is assured through a "rigorous regime" of testing as well as through communicating its importance to each of the unit's 1,600 employees. "The quality principles are embedded in every work group," Roed says. "Each group evaluates itself."

In addition to quality, safety also is vital to the operations at BD Diagnostics. "Safety and efficacy of our products is central to everything we do," Roed says. "We also have a very active worker safety program. Part of our mission is to help all people have healthy lives, and that includes our associates."

BD Diagnostics tracks its safety rate, which is better than the national average, and considers worker safety as another pillar of performance for each work team. As the company's continuous improvement program expands, so do its safety metrics. "We are moving to more predictive metrics and a proactive approach," Roed continues. "There is always room to improve."

BD Diagnostics Systems' continuous improvement efforts also are having an impact on the development and launch of new products in teams.

Using Six Sigma and lean tools, throughout the design process will allow BD to further integrate the manufacturing process with design and development. Currently the company is piloting a program of Design for Six Sigma that does exactly that. "That's a new thing we're working on and one more element critical to our future success," Roed continues. "We believe it's the right way to go."

This is important as BD Diagnostics Systems has many ideas "on the drawing board" for both its existing lines and new products as well. "We are looking for continued growth and to use some of the capabilities we hope to be building," Roed says. "These will give us a competitive advantage to help us grow."

As continuous improvement rolls out across the organization, Roed said he anticipates the effort will build upon itself. "The great thing about continuous improvements is the more you focus on it, the more opportunity there is," he says. "You see something new everyday. You can blitz an area one day, come back two weeks later and do it again."

Not only does Roed see Six Sigma, Lean, and the other pillars of performance as the way to rejuvenate operations but also as a way to create excitement throughout the workforce. "It's really great to see people get excited and to see the growth we gain using these tools," he continues. "We have a very strong history as a corporation in manufacturing excellence and applying these tools and technologies is going to continue to fuel the energy there." ■



A worker loads sealed panels into the PHOENIX Automated Microbiology System

# Partnering for accelerated performance

## Kaufman Global and BD's journey to operational excellence

It was three years ago when BD, one of the world's leading medical technology companies, made the decision to undertake the implementation of Lean and operational improvement on an enterprise-wide scale. Out of their partner selection process came Kaufman Global, a niche firm that specializes in the process of implementation. The partnership remains intact today, with both parties focused on the two elements deemed key to their mutual success: 1) Implementation – the process by which an organization achieves and sustains change, and 2) Results.

To help BD meet its objectives, Kaufman Global deployed its Lean Leadership® approach at BD facilities across the globe, including North and South America and Europe. They describe this program as a formal approach that enables “Lean Leaders” within organizations to be expert at both the technical aspects of Lean (Value Stream Mapping, Kaizen Events, etc.) and implementation and change management methods. “One of the real benefits of our approach is the high level of consistency and involvement we create and sustain across multiple sites simultaneously,” said Jerry Timpson, President of Kaufman Global.

Kaufman not only works with the individual expert practitioners at BD, they also work with leadership to help them understand their role in the improvement process. “Tight linkage up and down the organization, involvement (by everyone) and ownership are critical success factors for our engagements,” said Bill Lareau, Chief Implementation Officer for Kaufman Global. “There is a constancy of purpose toward operational excellence among the leadership at BD that has made our work together extremely effective,” said Lareau.

From the beginning, Kaufman Global and BD never lost sight of the need for results. Both organizations shared a common philosophy that training on the tools of operational excellence is not implementation, and the real measure of success is achieving business results that are measurable, verifiable and repeatable. For BD, the results have been all of those things and more—significant operational improvements are translating directly to the bottom line, increasing shareholder value and driving BD's competitive edge in the market. “They are an ideal client-partner,” said Timpson, “They understand and embrace the importance of implementation at every level of their organization, and we are thrilled to have played a part in their continuing success.”



Published on behalf of

### Kaufman Global

For more information please contact

**telephone:** 317-818-2430

**email:** [info@kaufmanglobal.com](mailto:info@kaufmanglobal.com)

**web site:** [www.kaufmanglobal.com](http://www.kaufmanglobal.com)

Kaufman Global specializes in the implementation of strategic initiatives for organizations in need of accelerated performance and sustainable results. By leveraging the deep industry experience of its professionals as well as its network of global affiliations through its parent company, Implementation Services, LLC, Kaufman has been delivering implementation solutions to Fortune 500 companies since 1995. ●