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'Lean thinking' keeps state manufacturers competitive



PHOTOGRAPH BY KATHLEEN RYAN

James Arthurs, executive vice president of Gerber Technology in Tolland, stands in front of Gerber's computerized cutting machines. Gerber has 13,000 customers worldwide, and its machines are used by a variety of manufacturers, from the clothing industry to the aerospace sector.

By Diane Weaver Dunne

Imagine having a pair of jeans made specifically to your dimensions and body shape by Lands' End Custom and then shipped directly to your home within two to three weeks at nearly half the average cost of custom tailoring. Or a Brooks Brothers suit or dress shirt customized to your specific measurements, then ready within weeks.

Gerber Technology in Tolland, a Gerber

Scientific company, makes the AccuMark Made-to-Measure technology and cutting machines an example of "lean manufacturing" which enable these companies to make custom clothes quickly and for less money.

Reducing waste, improving productivity and guaranteeing high quality are among the reasons custom clothes are affordable, said

James Arthurs, executive vice president of



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Lean

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Gerber Technology, which makes machines and software for some 13,000 manufacturers.

"This is really another name for mass customization," Arthurs said, noting Gerber's "smart" machines can figure out how to modify the way to cut different types of fabric, from denim to a stretch material along with its made-to-measure software that communicates to the cutting machines an individual's dimensions. Custom tailoring is easier, quicker and less expensive. This type of adaptability is key in today's competitive global marketplace, he said, noting Gerber machines can be programmed

quickly to make one item or thousands, depending on the order.

The company's use of technology to improve manufacturing began with Gerber's founder, H. Joseph Gerber, who realized computer-assisted design would enhance his machinery.

Today, Gerber continues its founder's legacy by making advanced computer design and communication programs, imperative to Gerber's success as a global competitor. It also continues to dedicate funds for research

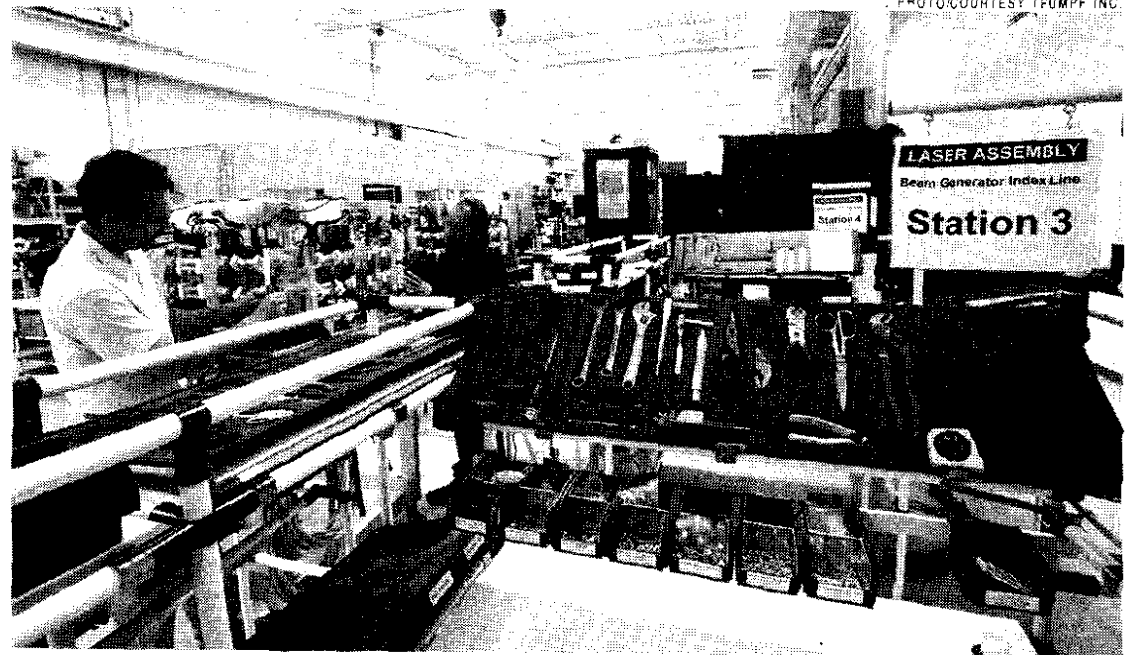


PHOTO: COURTESY TRUMPF INC.

Two TRUMPF employees assemble a high-powered laser resonator that will be integrated into a TRUMPF laser machine that cuts sheet metal. The TRUMPF laser factory in Farmington is one of the largest industrial laser manufacturing facilities in the U.S. TRUMPF also makes a high-speed punching machine that combines TRUMPF punch head technology and automation with the speed, flexibility and compact size required by "just-in-time" and "lean management."

and development, even during economic downturns. Gerber's latest communication product, the WebPDM (Product Data Management) System, allows manufacturers to stay in touch electronically with their other global operations, allowing for data transfers of patterns or other designs in real-time.

Gerber, like TRUMPF Inc. in Farmington, designs and builds technology used by other manufacturers.

Burke Doar, vice president of customer services for TRUMPF, agreed communication technology is imperative for today's manufacturers because plants often are located far from corporate headquarters.

TRUMPF's Teleservice and Telediagnostic Remote Access Monitoring allows TRUMPF staff to repair problems from their Farmington location 24 hours a day, seven days a week, an example of how new technology can optimize factory operations. "You actually see the same screen the operator sees in a live, [real-time] state," Doar said.

Technology has to be intuitive, he said, likening it to the simplicity of automobile dashboard indicators that alert

the operator about various fluid levels.

"Software should not be so extensive that it gets in the way of producing parts," Doar said. "The software must be easy to use and easy to navigate through. It must maintain the machine at optimal operation levels, but not be so sensitive that it holds up the machine."

• Software should not be so extensive that it gets in the way of producing parts. •

*- Burke Doar
v.p. customer services,
TRUMPF Inc.*

TRUMPF's laser and punching machines are designed with lean management in mind, part of what the company calls TRUMPF SYNCHRO CELL to reduce waste while achieving high production.

An increasing number of Connecticut industries are embracing lean management, said Frank Johnson, executive director of the Manufacturing Alliance of Connecticut. "We

make one-third more product with one-third less people," he said, noting that the state is one of the nation's leaders in production.

Not one type of technology is in the forefront, he said. "Overall, the advent of running machines by computer, the transfer of data and documents of blueprints electronically has been a great benefit for the speed and ease of

manufacturing," Johnson said.

While computer numerical controls (CNC) revolutionized the manufacturing industry during the 1970s, lean thinking combined with technology, especially for smaller job shops, took state manufacturers to the next level, said Gerry Ward, president of CONNSTEP in Rocky Hill, a non-profit organization funded by state and federal money to assist manufacturers.

"Lean is in fact a technology itself," Ward said. "I view technology as just knowledge embedded in a practice or a product. To me lean is technology and technology is about doing things smarter. The state is absolutely on the right track in supporting that. The results are dramatic; it is the prerequisite of success."

To James Womack, president of the Lean Institute in Massachusetts, keeping costs down is more about thinking lean than about new technology, which is important only when it solves a particular problem.

Some Connecticut companies have been in the forefront of implementing lean thinking for the past 15 years, such as Danaher's Jacobs Vehicle Systems in Bloomfield, Womack pointed out. The old trend to automate everything with huge, capital-intensive robotic machines dedicated to making one part during the 1970s hindered manufacturers, he said.

Lean thinking reintroduced human labor into what is referred to as a cell flow process. This process utilizes smaller machines with increased flexibility that can adapt more quickly to changes in the marketplace.

The idea isn't new, originating at Toyota about 50 years ago, Womack said. Simple machines are organized in a row, and one person working in a small area walks the part from machine to machine. Less technical support is required because the machines are less complex and better able to adapt to changes in product orders more quickly. "There was a big, big cost savings [in employing lean thinking] and it actually

works," Womack said.

Adding new technology for the sake of technology isn't always the answer, said Bob Emiliani, president of the Center for Lean Business Management LLC and a professor for the Lally School of Management and Technology at Rensselaer in Hartford.

"The managers of a lean business will be very careful of where and how they use technology. New technology might look on the surface very attractive, but when you look at it more closely, it might reduce flexibility and cost you a lot of money."

The outsourcing of jobs to other nations offering lower labor costs have pressured state aerospace manufacturers to change the way they think about how they manage their business, said Al Samuel, executive director of the Aerospace Components Manufacturers, a non-profit organization with 40 members that employs 3,600.

"We have tried to make us more viable by using lean management as a discriminator," he said, which is helping to keep jobs in the state. The organization has brought competing manufacturers together to take advantage of Connecticut's unusual concentration of aerospace manufacturers within 25 miles of Hartford and use that fact as a selling point to attract new business.

As ACM aims to recruit new business from overseas, one of its key marketing points is explaining how oversight costs in the Hartford region are much lower because the product is made within one small geographic area, Samuel said. ■

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*–Bob Emiliani
president, Center for Lean Business Management*

State manufacturing characteristics



The Manufacturing Alliance of Connecticut compares the competitiveness of state manufacturers with those in other states each year. Called the MAC Index, it addresses several factors manufacturers use when considering relocation or expansion decisions, such as costs, economic structure, physical infrastructure and productivity.

The following are some highlights of MAC's most recent report on 2001 manufacturing trends:

- ◆ **Connecticut is among the nation's most costly associated with manufacturing production, ranking 48th.**
- ◆ **The state is considered among the best in workforce productivity, ranking 4th nationwide, up from 7th in 1992.**
- ◆ **Connecticut manufacturers sell more than \$17 billion worth of goods to Connecticut firms.**
- ◆ **Half of the state's patents come from manufacturers, and the state ranks No. 1 among all states in relative new patent activity.**
- ◆ **There are 5,803 manufacturing establishments in the state, with the highest concentration, about 29 percent, located in the Hartford region.**
- ◆ **The total annual payroll for the state's manufacturing industry is \$10.5 billion. The average hourly wage is \$15.81.**
- ◆ **State manufacturers employ 252,706, with 155,225 of that number as production workers.**