advanced manufacturing

Michigan's advanced manufacturing sector includes companies that are able to leverage the state's position as the global capital of vehicle R&D with thousands of highly skilled engineers and scientists. Many of the world's major corporations have established more than 330 R&D tech centers here. And with some 15,000 manufacturing establishments in the state, Michigan's high-quality engineering and skilled manufacturing capabilities continue to attract businesses in diverse industries.

Nick Moroz agrees that Michigan is a good location for advanced-manufacturing companies. As vice president of engineering and product development for **CSquared Innovations LLC** of Ann Arbor, MI, he leads the company in commercializing a low-cost material synthesis and deposition system that will accelerate and expand lithium-ion battery markets and eventually revolutionize other industries.

The company's technology brings battery material synthesis and cell manufacturing onto one common platform. "CSquared provides unprecedented simplicity, capital efficiency and battery-cell design flexibility," says Moroz, and allows for the production of high-temperature (140°C), high-energy density and intrinsically safe lithium-ion batteries.

One reason CSquared located in Michigan is that the state is "quickly becoming one of the world's hotspots for emerging battery technologies," Moroz says. "The region is rich in technical expertise, potential partners and equipment and materials suppliers for this industry, and we are contributing to an ongoing shift toward a more entrepreneurial culture."

An Accelerate Michigan winner (see sidebar, page 35), CSquared also won the DTE Clean Energy Prize in 2011. "Using these funds, founder contributions and customer revenues from R&D contracts, we are establishing a facility in Farmington Hills, MI, to scale up production of advanced batteries," Moroz says. The company plans to hire eight to 10 employees for management and technical roles by the end of the year.

Another fast-rising advanced-manufacturing company in Michigan is **Hirotec America** of Auburn Hills. It is the premier leader in automotive assembly and hemming solutions for closure panels, such as doors, hoods and liftgates. "This year, we are introducing two new solutions that will revolutionize our industry," says Jim Toeniskoetter, president & COO at Hirotec.

"First is our patent-pending horizontal hemming press," he says. "This innovative hemming press provides numerous benefits to the automotive industry, including up to 73 percent floor-space savings, 75 percent energy- or operations-cost reduction and potential for capital reuse. There are no other press and die systems available that are similar to ours in the market."

Hirotec America's innovative horizontal hemming press

The second is Hirotec's new remote laser welding solution for the closure assembly process. "This solution will provide automotive manufacturers a way to maximize production and increase speed to market," Toeniskoetter says, noting that it also provides high quality, repeatability and processing flexibility.

DASI Solutions of Pontiac, MI, is growing, too. The auto-related engineering software company recently began selling a rapid prototyping machine that creates three-dimensional prototypes in a fraction of the time that the process formerly demanded, and allowed the company to expand its client base, as well as the number of its employees.

Michigan's R&D Strengths

- #1 state for vehicle-related R&D, spending $11.8 billion annually
- #4 in the nation in research intensity (ratio of expenditures to gross state product)
- #4 in the nation for engineering graduates
- Industrial and research assets at 360 research sites focused on industrial technology
- Home to 47 of the top 50 global automotive suppliers

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