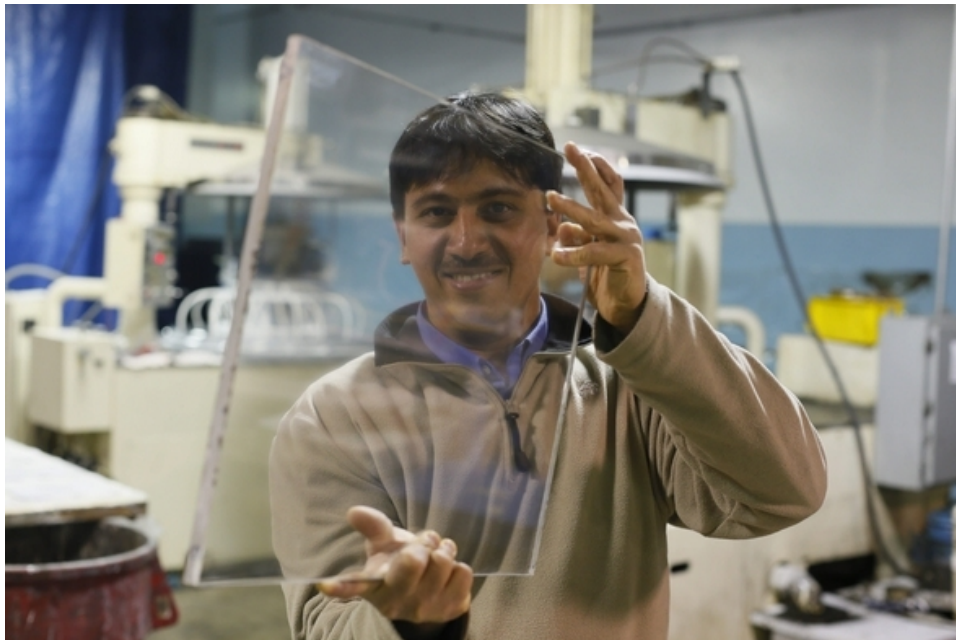


## Business



Nagendra Nag, a group manager, at top, holds up a plate of transparent armor, and technician Jim Larsen works with a polishing machine at Surmet Ceramics Corp. Photos by Derek Gee/Buffalo News

### **Built-to-last Surmet reflects aspiration for advanced manufacturing to generate growth**

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Surmet Corp.'s products are built to withstand trying conditions.

The company makes durable window panels for armored vehicles, protecting soldiers while giving them a better view of outside threats. The company also produces window panels used in aircraft carrying reconnaissance cameras, and sturdy domes for missile systems.

Surmet's products are made of transparent ceramics, which starts out as synthesized powder produced in a nondescript plant at the rear of a North Buffalo plaza.

Suri A. Sastri, the founder, chairman and CEO of Massachusetts-based Surmet, says he is determined to make the Hertel Avenue facility a busier and more successful place for manufacturing the company's products. "The facility is good. It has tremendous potential. As we grow here, we'll be able to hire more people and do more stuff. It's an ideal place for specialty manufacturing."

That is the same message economic development officials are trying to spread about advanced manufacturing in the Buffalo Niagara region. They hope to capitalize on the region's industrial heritage by cultivating more high-tech production.

"It's important because it's one of our largest industry sectors, employs 50,000 people in our community," said Christina Orsi, Empire State Development's regional director.

Along with that direct employment, she said, the impact is also felt indirectly, through suppliers selling to the manufacturers.

The push to stimulate manufacturing growth takes several forms. An Advanced Manufacturing Institute will open in a temporary home on Main Street in Buffalo, designed to help local

manufacturers develop new products and services.

A workforce training center is planned to ensure a readily available supply of labor. And there are headline-grabbing efforts like RiverBend, a \$1.7 billion manufacturing complex planned for South Buffalo that will initially house two green energy companies (the state is committing \$225 million to the project; the companies have said they will invest \$750 million each).

The Buffalo Niagara region's average annual manufacturing employment in 2013 was 39 percent lower than it was 20 years earlier, although the figure has been fairly stable since 2009. The question has become how to raise the total, rather than just slowing the rate of decline.

Smaller companies like Surmet figure into the equation.

Sastri started Surmet Corp. in 1982, after working as director of the chemical and materials research division of Gillette Co. He initially built Surmet to supply the semiconductor industry – the company's name draws on those roots, combining the words surface treatment and metallurgy. Sastri later grew interested in expanding into ceramics and struck a deal with defense contractor Raytheon. That deal, in turn, led him to a discovery in Buffalo.

Raytheon had developed a transparent hard ceramic called Alon (short for aluminium oxynitride), described as having the appearance of glass and "phenomenal ballistic properties."

Surmet in 2002 acquired the rights to commercialize Alon, and later acquired Alon outright from Raytheon. The ceramic powder for Alon had been processed at the Hertel Avenue plant by Advanced Refractory Technologies, before ART was bought in 2001 by Tyco and added to Tyco's M/A-COM unit. Tyco cut jobs at the M-A/COM plant and then closed it in 2002, consolidating the work elsewhere.

Sastri visited the Buffalo plant in late 2002, after it had shut down, as he was deliberating where to produce the powder he would need for Alon. He came away so impressed with the site's potential, he decided to lease the 75,000-square-foot facility from Benderson Development, and acquired assets from the former M/A-COM operation.

Surmet has operated rather quietly in Buffalo over the years. Sastri said the company has spent about \$25 million on the plant, on expenses like rent, power, equipment and personnel. Surmet generates annual sales of about \$10 million. Its two other facilities consist of a manufacturing plant in California, and its headquarters and production facility in Burlington, Mass. Combined, the three locations have about 50 employees.

While Sastri envisions the Buffalo plant as a hub for processing powder, Surmet also has invested in furnaces for heat treatment and machines for polishing and grinding at the Buffalo site.

Last year, the American Ceramic Society named Surmet the winner of its Corporate Technical Achievement Award, for development and commercialization of Alon.

"This is an important milestone in the advancement of ceramic technologies," the award committee said in its recommendation to the society's board of directors. "In addition to providing safety for soldiers and military equipment, broader commercial applications are expected from the technology."

The award is significant because it is not necessarily presented each year, said Lee M. Goldman, Surmet's vice president and chief technology officer for its optical ceramics division. No winner was chosen in 2011 or 2012. In 2010, there were two winners; one was Corning Inc., for Gorilla Glass.

Surmet also got a boost late last year when DARPA – the Defense Advanced Research Projects Agency, the new technology arm of the Department of Defense – awarded Surmet a \$4.66 million contract, spread over three years, for production of Alon ceramics.

Past financial support from a Defense Department program has enabled the company to make larger windows and lower the cost of heating used in its production process, Goldman said. "They've been tremendous supporters of ours."

Sastri has been selective about the markets where he can establish a foothold for Alon, concentrating first on aerospace and defense. "We have to focus ourselves into the area where the price is good, where they are willing to pay," he said.

Window panels made of Alon in military vehicles provide an advantage over panels made of glass in combat, said Sundeep Rele, Surmet's corporate vice president and head of operations. Glass-based transparent windows have to be kept small to stay within a vehicle's weight specifications.

"What has happened is that, out in the battlefield, as we tried to protect our armed services inside these specialized vehicles, the aperture has grown smaller and smaller because that is now an opening for the enemy to launch his attack," Rele said. But a smaller aperture also limits soldiers' peripheral vision, obscuring threats that might be looming outside, he said.

Surmet can provide large, sturdy window panels made of Alon that can provide heavy-duty protection, without choosing between safety and "situational awareness," Rele said.

"You take a part which is not just resistant to bullets, but you make it functional," said Nagendra Nag, Surmet's group manager of advanced process development. "When you make it functional, you enhance its capabilities even more."

Smaller manufacturers like Surmet don't create a big splash like RiverBend. But Orsi said small companies are "critical" to the region's manufacturing sector. "Most of our manufacturers are our small to midsize manufacturers," she said. "That's who we're really doing this for." The idea is to ensure there are skilled workers to hire and that they have access to resources to develop new technologies.

"We have already a lot of the pieces in place to help them grow, not only our existing (companies) but be a magnet for other manufacturers that want to be in the U.S. to do it here," she said.

Sastri believes that demand will come, with the potential to expand into the biomedical and semiconductor industries.

"Anything good takes effort and time," he said. "We have to invest in it."

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