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Urbana company explores new twists in refrigeration, air conditioning

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URBANA – Creative Thermal Solutions has been around only seven years, but already the Urbana-based company has made a mark.

The firm, which works on dozens of air-conditioning and refrigeration projects, employs 30 people, many of them highly educated researchers.

Its headquarters, at 2209 N. Willow Road, has gone through three expansions, and company President Predrag "Pega" Hrnjak said he hopes to embark on another in two months.

The company is probably best known for the \$1.8 million in work it has done for the Defense Department, developing a lightweight cooling system that can be worn by soldiers.

Those "Hummingbird" cooling vests, still in development, were demonstrated Thursday to U.S. Sen. Dick Durbin, D-Ill., who tried one on himself.

The current cooling systems worn by soldiers, Hrnjak told Durbin, "are so bulky they don't like it."

The Hummingbird vest systems will be significantly lighter – 5 pounds or less, compared with 8 pounds for the current system, said Stefan Elbel, the company's chief engineer.

Plus, there won't be a water loop in the vest; instead, circulating refrigerant will do the cooling, with help from an oil-free compressor.

Creative Thermal Solutions has developed other things for the military: huge environmental control units (think "air conditioners") for tents and mobile hospitals.



Photo by: Robert K. O'Daniell photos/The News-Gazette

President Predrag 'Pega' Hrnjak shows equipment that quantifies refrigerant emissions at the testing facilities at Creative Thermal Solutions in Urbana last week.



And most recently, the company worked on a co-generation project that takes waste heat from a diesel engine and turns it into additional cooling.

That project was made possible with money from the American Recovery and Reinvestment Act, also known as the economic stimulus bill.

Creative Thermal Solutions also takes part in many private-sector projects, ranging from work for the automotive industry to supermarket display cases that are more energy-efficient and environmentally sound.

Hrnjak, the company's majority owner, is a research professor in the Department of Mechanical Science and Engineering at the University of Illinois. He's also co-director, along with Anthony Jacobi, of the university's Air Conditioning and Research Center.

Hrnjak came to the UI during the 1992-93 school year, after serving on the faculty at the University of Belgrade in what was then Yugoslavia. He said he came at the invitation of professors Will Stoecker and Clark Bullard.

But after several years at the university, Hrnjak felt there was a role for a private company doing air-conditioning and refrigeration research – and formed Creative Thermal Solutions.

"I wanted to do something bigger," Hrnjak said last week, explaining the impetus for forming the company. "There's a need to go beyond the university. We needed to make another bridge between university research and industry – (doing) relevant research that would dive into real problems."

One of the first projects the firm tackled was one for General Motors involving compressors. The auto industry accounted for 70 percent of Creative Thermal Solutions' business in its early years, Hrnjak said.

But with that industry coming under increased pressure the last few years, the company has diversified its work.

Today its projects include carbon dioxide refrigeration systems, ammonia chillers with micro-channel condensers and new types of heat exchangers, to name a few.

Too technical for you? You're not alone. Durbin, as he listened to an overview of the company's work, confessed much of it was over his head.

"I'm a liberal-arts major and a law school graduate, and you're losing me," he said.

But the senator asked pointed questions about how the cost of the cooling vests compared with systems used now, whether the sound of the enabling battery would be reduced and how soon the vests would be field-tested.

After Creative Thermal Solutions was founded in 2003, it operated from a small house and Quonset hut at its current location. At that point, it had only four "environmental chambers" in which to conduct tests.

But three years later, in 2006, a new building was added, providing 11 more environmental chambers, as well as a metal shop, electrical shop and conference room.

A second expansion came in 2008 when a brick addition facing Interstate 74 provided more space for engineering offices and meeting rooms.

Last year, the company expanded to the north, creating more room for experimentation. The company now has more than 20 environmental chambers .

The company also has its own machine shop, calibration lab, brazing lab, electronics shop and a large conference room where short educational courses can be offered.

Hrnjak's not finished. Creative Thermal Solutions recently acquired 8 acres adjacent to its building, and plans call for expanding first to the north and then to the west. The first phase of that expansion is expected to get under way in two months, Hrnjak said.

Creative Thermal Solutions' revenues are growing about 30 percent a year, Hrnjak said, and its staff includes eight employees with doctorates and seven with master's degrees.

He told Durbin the company expanded from 14 to 29 employees in the last two years, and 12 of the employees recently bought homes in the area.

Already, Creative Thermal Solutions is preparing for 2013, when it will celebrate its 10th anniversary. That year, Hrnjak said, will also mark the 25th anniversary of the Air Conditioning and Refrigeration Center and the 100th anniversary of thermal science being taught at the UI.

Creative Thermal Solutions

Business: Air conditioning and refrigeration research and development projects for industrial, commercial and military clients

Address: 2209 N. Willow Road, U – just north of Interstate 74 between Cunningham and Lincoln avenues

Founded: 2003

Employees: 30

President: Pega Hrnjak

Chief operating officer: Will Stoecker

Chief engineer: Stefan Elbel

Manager of engineering: Xinzhong Li

Web site: <http://www.creativethermalsolutions.com>

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