



ASSOCIATION OF
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IOWA STATE
UNIVERSITY



CECE

INNOVATION AND ECONOMIC PROSPERITY UNIVERSITIES
AWARDS PROGRAM

CASE
STUDY
2020

IEP CATEGORY – INNOVATION

**Iowa State University:
CIRAS Impacting Iowa
Manufacturing**

ABOUT IOWA STATE UNIVERSITY'S CIRAS RESPONSE TO IOWA MANUFACTURERS' INNOVATION NEEDS

Iowa State University's Center for Industrial Research and Service (CIRAS) was founded in 1963 as an outreach program to improve life in Iowa's communities by strengthening their businesses. CIRAS works with a variety of federal grant programs and through a vast network of industry experts to provide services in the areas of Growth, Leadership, Technology, Productivity, and Workforce. The center works primarily in seven industry sectors that make up roughly one-half of the Iowa economy, with some programs making a concentrated effort to assist small and medium-sized manufacturers.



Quentin Hill, ISU engineering graduate, and Stephen Mann, ISU intern, representing Danfoss Power Solutions at an innovation-themed event at the Iowa State Capitol

PARTNERSHIPS IN THE BRINK OF THE PANDEMIC

In March 2020, faced with severe Iowa needs for medical personal protection equipment to be used in fighting the COVID-19 pandemic, CIRAS identified two companies with complementary capabilities and encouraged them to collaborate. CIRAS worked with The Dimensional Group, a Mason City custom packaging and commercial printing firm, to secure material and develop a design for a face shield. At the same time, CIRAS experts also worked with Angstrom Precision Molding, a plastic injection molder based in Ottumwa, to develop a design and custom tooling for the production of “halos” that attach those face shields to wearers' heads. The team went from the initial meeting to production in 10 days.

Within a few weeks, the product went from a concept to producing in excess of 150,000 units per week. Working together at the initiation of CIRAS, The Dimensional Group and Angstrom Precision Molding quickly satisfied Iowa's stated need for more than 500,000 face shields – and sold them at a \$1.25-per-unit price well below the market average. The company expects to begin supplying out-of-state customers in May 2020, once the last delivery is made and Iowa's needs have been met.

Both businesses praised the role CIRAS played in facilitating their venture – a step that also allowed The Dimensional Group keep its 75 employees working in a pandemic-damaged economy.

“There’s a significant component to this where it’s helping our business stay open,” said Adam Gold, Dimensional Group president. “I’d have no work next week if we weren’t doing this.”

This is just one example of CIRAS efforts to help Iowa companies innovate.

OPENING OF THE DIGITAL MANUFACTURING LAB

In September 2019, CIRAS partnered with Alliant Energy Co. to open a Digital Manufacturing Lab. This facility, located in the Iowa State University Research Park, serves as a technology laboratory where companies can experiment with new technologies and test the potential impact on their businesses in a no-risk setting. CIRAS so far has worked with more than 75 companies to educate them about a variety of technologies, including 3D printing, 3D scanning, and various forms of automation, including collaborative robots.

Malven Fire Tool Works

Fred Malven, owner of Malven Fire Tool Works in Nevada, Iowa, worked through the “Digital Manufacturing Lab powered by Alliant Energy” to scan and reconfigure some of Malven’s decades-old designs for tools used by firefighters (See photo). CIRAS experts used a 3D scanner to create digital CAD models and 3D printed samples of Malven’s tools. Those files then were modified to add new improvements – such as, for example, adding sharper edges and ridges to keep a cutting tool’s blade from getting stuck in the door it’s meant to chop down.

Malven, who sells to fire departments around the country, said inquiries about his tools doubled in four months after he unveiled the new designs. New, customer-driven digital designs have helped the company stand out in an industry that historically has been dominated by hand-forged products that tend to vary greatly in size, shape, and quality. “This has really enabled me to get an identity in the marketplace that is one of precision and uniformity,” Malven said.

Danfoss Power Solutions

The list of other technology outreach projects at CIRAS includes Danfoss Power Solutions, a world-class provider of mobile hydraulic and electrification products

based in Ames, Iowa. Danfoss contacted CIRAS to explore the value of adding 3D scanners to its production processes. After some experimental projects with CIRAS, the company eventually purchased its own 3D scanner and has used it, in combination with 3D printers, to design and create replacement parts for frequently breaking fan blades.

“In some cases, you only have 2D drawings” for crucial parts, said Craig Klocke, head of additive design and manufacturing for Danfoss Power Solutions. “In some other cases, we don’t even have the drawing. Now the thing is broke, and we need to fix it. What are we going to do?”

By helping the company find innovative solutions to such problem, CIRAS has helped make Iowa industry more efficient and more sustainable. Helping companies embrace new technologies – by taking away the risk that companies might mispend valuable capital on an ill-informed technological choice – also makes it more likely that Iowa manufacturers will prosper and grow.

At the same time, CIRAS is using its technological perch to enhance the educational value received by Iowa State University students. Quentin Hill, a recent Iowa State engineering graduate, now works for Danfoss Power Solutions utilizing the same technology he used as a student. Hill and Stephen Mann, an Iowa State University intern, both represented Danfoss Power Solutions during a recent innovation-themed event at the Iowa State Capitol. (See photo).

LINKS TO FURTHER INFORMATION

Articles:

- [CIRAS helping Iowa's factory lines shift to protect front-line workers](#)
- [Iowa State University Opens Digital Manufacturing Lab](#)
- [Danfoss Explores Exciting Possibilities of 3D Scanning](#)

Partnering Organizations:

- [The Dimensional Group](#)
- [Angstrom Precision Molding](#)
- [Alliant Energy Co.](#)
- [Iowa State University Research Park](#)
- [Malven Fire Tool Works-Malven Works](#)
- [Danfoos Power Solutions](#)

ABOUT APLU

The Association of Public and Land-grant Universities (APLU) is North America's oldest higher education association. APLU is a research, policy, and advocacy organization dedicated to strengthening and advancing the work of public universities in the U.S., Canada, and Mexico. The association's membership consists of public research universities, land-grant institutions, state university systems, and affiliated organizations.

APLU's mission is to: expand access and improve student success to deliver the innovative workforce of tomorrow; advance and promote research and discovery to improve society, foster economic growth, and address global challenges; and build healthy, prosperous, equitable, and vibrant communities locally and globally.

Based in Washington, DC, the association's work is furthered by an active and effective advocacy arm that works with Congress and the administration as well as the media to advance federal policies that strengthen public universities and benefit the students they serve.

ABOUT THE IEP UNIVERSITIES PROGRAM

APLU and its **Commission on Economic and Community Engagement (CECE)** established the Innovation and Economic Prosperity (IEP) Universities Program to help higher education institutions codify, elevate, and advance their campus enterprise supporting economic and community development.

The **IEP designation program** recognizes institutions that have demonstrated a meaningful, ongoing and substantial commitment to economic and community development, growth, and economic opportunity.

The **IEP awards program** recognize exemplary and innovative projects in university-based economic and community engagement:

- **Talent** and workforce development
- **Innovation**, entrepreneurship, and tech-based economic development
- **Place** development through public service, outreach, and community engagement

Learn more at: www.APLU.org/IEP