

people finding a better way

Dana Incorporated is a Fortune 500 company with a more than 115-year history as a supplier for the mobility industry. Employing 36,000 employees in 33 countries with manufacturing facilities worldwide, the company equips its customers with critical drive and motion systems; electrodynamic technologies; and thermal, sealing, and digital solutions across the light-vehicle, commercial-vehicle, and off-highway markets.



Dana Incorporated

INDUSTRY

Automotive

APPLICATION

Tools & Fixtures, End-Use

LOCATION

Multi-site

CUSTOMER SINCE

2018

MATERIALS

Onyx, Continuous Carbon Fiber, 17-4 PH
Stainless Steel

“Additive is a situation where if you’re not engaged, if you’re not learning, if you’re not driving innovation from it, you’re going to miss the boat”

TERRY HAMMER

VICE PRESIDENT, LIGHT-VEHICLE AND GLOBAL CORE ENGINEERING
DANA INCORPORATED

INVESTING IN ADDITIVE MANUFACTURING

To stay competitive in the mobility industry, Dana was seeking a way to expand its engineers' ability to rapidly ideate and prototype more efficiently and effectively. It became increasingly clear that additive manufacturing was a great solution. A team was quickly put together to explore the opportunities that additive manufacturing could bring to Dana and find a reputable 3D printer company with which to partner. "Dana took a very structured approach to additive manufacturing," says Hammer. "We wanted to define the value first."

The team at Dana had heard about Markforged's best-in-class 3D printers and powerful software solution and started exploring the technology as an option. The company invested in two Markforged X7 3D printers and two Metal X systems, putting one of each in Maumee, Ohio, U.S.A. and Trento, Italy. "From the beginning, it was about being able to leverage additive manufacturing to provide more cost-effective replacements for specialized tooling," said Hammer.

If you know
Dana, you know
their slogan:
**People Finding
a Better Way.**
And I don't think
there's any better
example of them
living their core
values than this
whole initiative.

MIKE CADY

SALES DIRECTOR, MARKFORGED

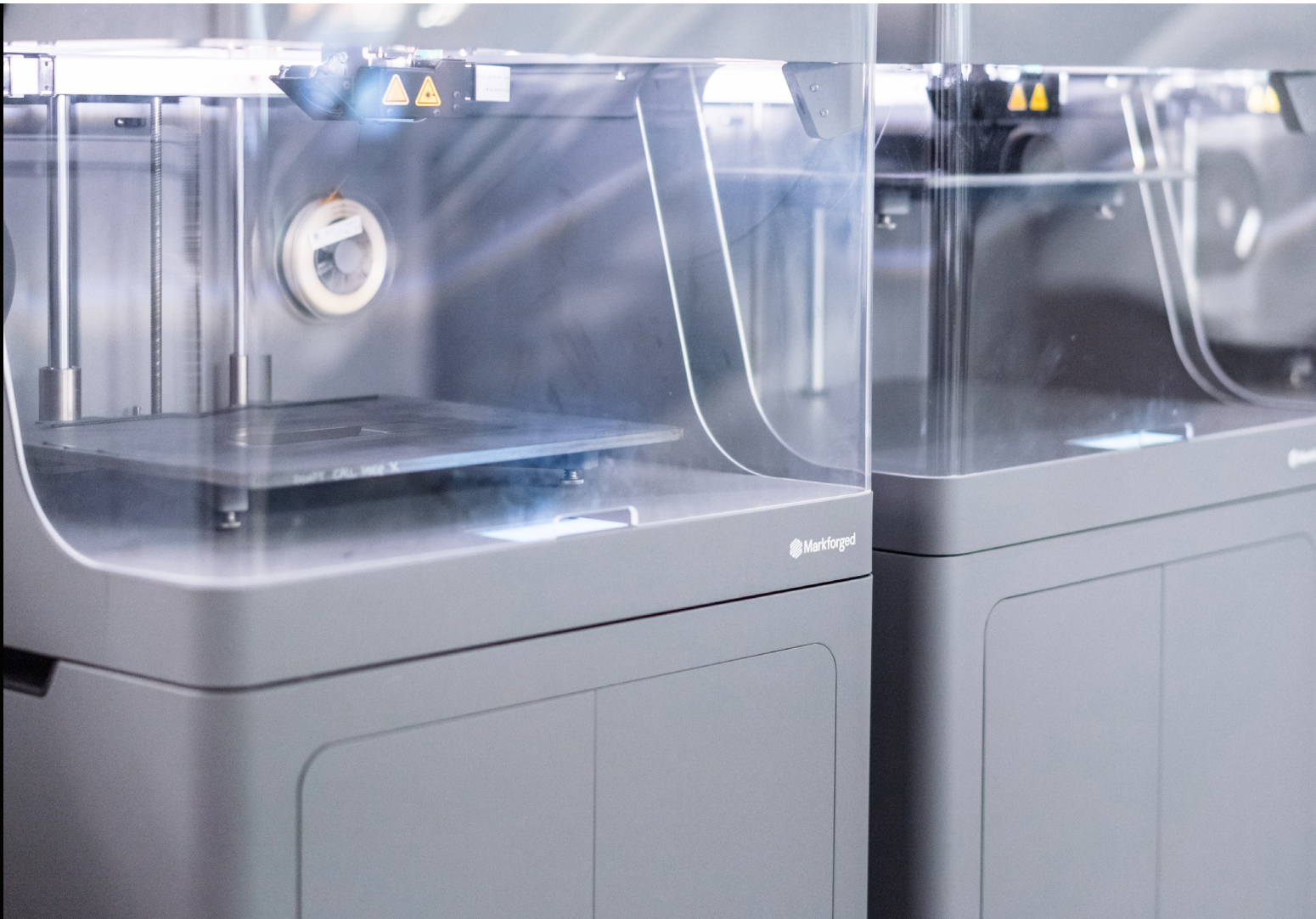


Markforged employees visit Dana for executive meeting.

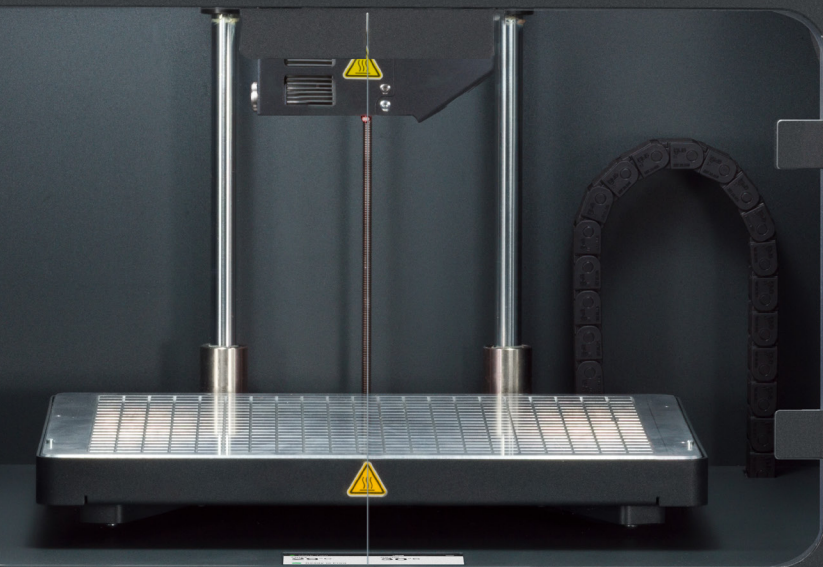
The company now has Markforged 3D printers across seven countries — including Italy, the U.S.A., Canada, Brazil, Germany, India, and China.

Dana's corporate motto is "People Finding A Better Way," which is truly ingrained in the company culture. Additive manufacturing is one area the company is leveraging to push the boundaries of its innovative spirit. When the initiative was approved, Kelly Puckett, Senior Manager of Additive Manufacturing, who has been with Dana for twenty years, was asked to lead the additive manufacturing efforts. "I'm tasked to ensure Dana uses additive more frequently or in a better way," he says.

Markforged VP of Sales Bryan Painter says that bringing the technology in is just the starting point. "You need to then think about how you're going to be successful and the value that you're going to get if you are successful," Painter says. "The rest of it is just technology. People and process are really what makes the difference."



Dana has Markforged 3D printers across seven countries.



 Markforged

“It’s not about buying a printer. It’s not about a material. It’s not about metal versus composites. It’s really about understanding the value at stake and how it aligns to the strategic direction of your company.”

BRYAN PAINTER

VP OF SALES, MARKFORGED

A STRONG COLLABORATION

Since 2018, Dana and Markforged have worked together to drive innovation, education, adoption, and operationalization within both companies.

From whiteboard sessions about the deployment plan to the creation of Markforged University — the educational program that aims to teach Markforged users about how to best use its technology — the two companies have collaborated with one another to continuously learn how to improve their businesses. “People throw the word ‘partnership’ around a lot,” says Mike Cady, Sales Director at Markforged. “But the level of trust was there from the start. We’re on the same team and that’s special.”

For Markforged, this collaboration has resulted in the creation of new products and services, as well as improved hardware, software, and professional services — thanks to Dana’s candid feedback. Some notable products and services made possible or better with Dana include Enterprise Eiger, Markforged University, Turbo Print, and Blacksmith. “They have taught us so much about selling, servicing, and supporting a large-enterprise Fortune 500 company,” says Painter. “They’ve taught us what it takes to implement a successful program at a company of that size. They’ve helped us mature our product in ways we were never even thinking about before we got engaged.” Cady agrees, stating “I don’t know if we get to where we are without Dana.”

Within Dana, there has been outstanding utilization, engagement, and understanding of additive manufacturing.

Several Markforged printers set up in one Dana facility.

More than 150 people from Dana have taken part in Markforged University so far, either in person or online, meaning that more and more engineers and designers have the tools they need to use their Markforged printers effectively. Andrea Aylward, Additive Manufacturing Engineer at Dana in Canada, says that the team gained a lot from completing Markforged University. “We got a handle on best practices and things to keep in mind when trying to design or adapt a design for additive manufacturing.”



ADDITIVE IN ACTION

By turning to additive manufacturing, Dana has been able to accelerate the pace of development and become a more agile business.

With a large network of Markforged 3D printers at their fingertips, the Dana team can quickly iterate and innovate.

Each manufacturing facility has a different need for additive manufacturing. In Ontario, Canada, the Power Technologies division has used its X7 3D printer to create functional forming dies — stamping sheet metal into proof-of-concept designs that would otherwise be cost-prohibitive and time-consuming to create. This allowed the team to rapidly test products and prepare for customer analysis in a more efficient, scalable way.

In Italy, Dana's Off-Highway advanced engineering team can often be found using their Markforged printers for internal tooling and fixtures. "The good quality of the composite parts of the X7 opens some very good opportunities in terms of tooling and fixtures," says Fabrizio Zendri, Advanced Engineering Manager at Dana in Rovereto, Italy. An application Zendri is most proud of is workholding gears that hold parts as they are being processed. At the end of 2020, the fixtures had been in use for over a year without failure, and have resulted in 70% cost savings and a 90% reduction in lead time per fixture.

In Maumee, Ohio, each tech center's additive manufacturing lead joins a monthly meeting with other leads to share findings, ideas, and concerns. Some centers even share designs that are printed in other global locations, and they're finding new and exciting ways to use their printers. This mindset has set them up for success, according to Markforged's Cady. "Dana as an organization



Kelly Puckett, Senior Manager of Additive Manufacturing at Dana, removing a part off the Markforged print bed.

is going to be able to move faster than many because they're designing with an additive mindset, even for the subtractive process."

Though many of Dana's engineers are spread out across different time zones, Eiger's cloud architecture allows them to work seamlessly as if they were in the same room together. They're able to share designs, get real-time analytics, and live telemetry in one place for easy global fleet management. "Eiger itself is a very simple software to use. It's very intuitive," says Puckett.

"Markforged has enabled Dana to find new ways to approach manufacturing and we look forward to exploring the opportunities for this innovative technology."

KELLY PUCKETT

SENIOR MANAGER OF ADDITIVE MANUFACTURING
DANA INCORPORATED

the road ahead

Now that Dana has started to adopt and deploy Markforged printers, software, and training, Dana is looking forward to the future and how they'll continue to be leaders in the mobility industry with the help of additive manufacturing. "We're expanding our facility to another floor of the building so we will have a better place for the machines, and we're finalizing the installation of the Metal X," says Fabrizio Zendri in Italy.

Scaling the speed and efficiency of prototyping operations across their global locations is key to the future success of additive at Dana. "We have begun to produce some of the tools and fixtures that we might have purchased on the outside before," says Puckett. "Especially as we go to the plants, the plant engineer that needs something printed with a machine — they need it today. And the faster we can get it to their hands with the least amount of effort for them to get it produced, the better off they are."



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