

# SIEMENS

*Ingenuity for life*

Automotive and transportation

## Freeform Technology

Freeform Technology uses NX to deliver the highest quality components at racing speed

### Product

NX

### Business challenges

Maintain quality and speed as company grows

Diversify across a range of sectors

### Keys to success

Integrated CAD/CAM/CAE capability

Automatic standard settings and templates

Flexibility to customize toolpath

### Results

24 hours from CAD to completed component

Absolute accuracy

Up to 50 patterns created per day

Rapid business growth



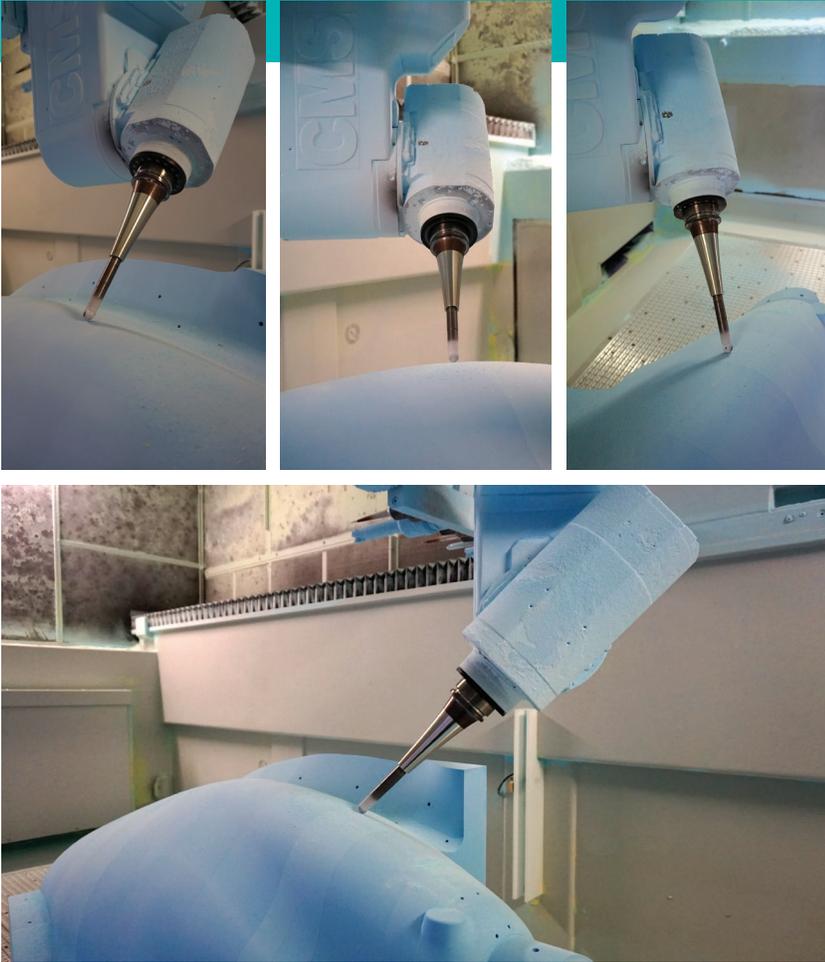
**Siemens Digital Industries Software solutions enable Freeform Technology to integrate design with tooling and optimize the manufacturing process**

### 100 percent correct in record time

Fractions of a second, microns of tolerance; in the exacting world of Formula 1® racing, triumph and failure are not far apart. With a background in that demanding environment, the two metalwork engineers who founded Freeform Technology in 2008 know the significance of meeting a specification exactly and delivering on time.

Spotting a market opportunity to apply precision machining methods in the composites field, Simon Burchett and Fred Hutton founded the company in 2008 with one machine and some hand-me-down tools. Now they have five machines, more than 20 employees and provide a range of services: tooling design and manufacture; pattern and model making; prototyping and design mock-up; and full project management of part manufacture.

From the beginning, they knew that they wanted to use NX™ software from product lifecycle management (PLM) specialist Siemens Digital Industries Software. "We were familiar with NX, we knew it could do



**“It’s a huge benefit to have an integrated design and manufacturing package. We can be very quick.”**

Jake Oliviera  
General Manager  
Freeform Technology

the job, and it was one thing we could rely on in the scary days of being a start-up,” comments Burchett. “Just to be sure, we did a benchmark test on other software, but we found that it was just not as good as NX.”

Freeform Technology quickly established a reputation for providing Formula 1 race car standards to the composite tooling industry. “We deliver an extremely accurate product very quickly,” says Burchett. “Our ongoing business challenge is to maintain that quality and speed as we grow across different industries.”

**Consistent quality, fast fulfillment**

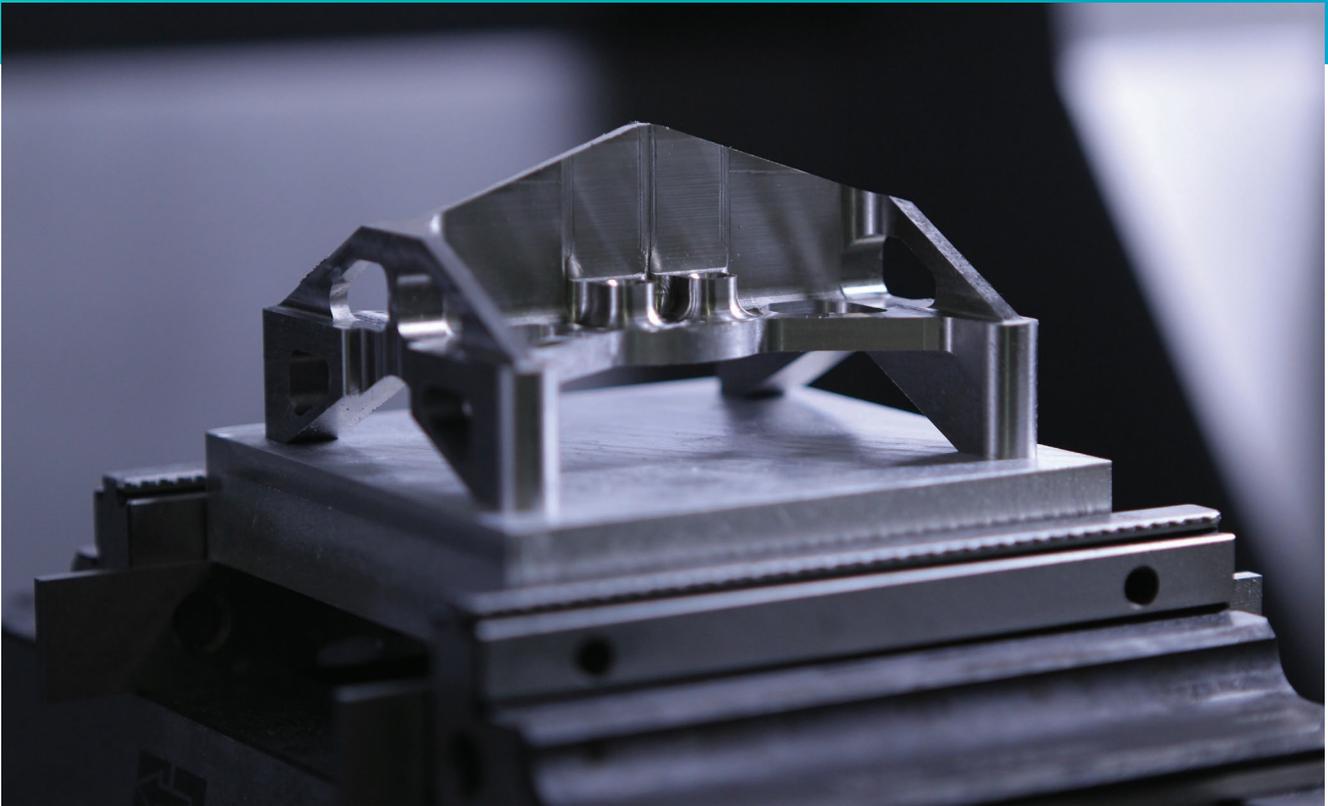
The company has four floating licenses of NX CAM (computer-aided manufacturing), enabling the software to be used by various members of the team. Well-established as a partner of Siemens Digital Industries Software in the United Kingdom (UK),

OnePLM helped Freeform Technology to set up the system and provides ongoing technical support. “The software is excellent, and the guys at OnePLM are very knowledgeable,” says Hutton. “They are available when we need assistance and always very helpful.”

Freeform Technology’s specialists use a customer’s computer-aided design (CAD) models and material specifications for tooling; or, using 3D laser scanning, they reverse engineer a component design in order to develop and manufacture patterns and tooling. The engineers check all CAD files thoroughly so that they are correct and optimized for manufacturing. In some instances, they recommend design changes. With some aspects of CAD included in the NX CAM licenses, Freeform Technology’s engineers also have design functionality. Instead of returning files that require amendment, they save precious time by making modifications on behalf of their customers. “It’s a huge benefit to have an integrated design and manufacturing package,” notes Jake Oliviera, general manager at Freeform Technology. “We can be very quick.”

Burchett and Hutton have a deep understanding of tooling processes and procedures and, building on that, they have developed a range of templates within NX CAM. These are preset CAM files with pre-determined tool settings and cut depths. Similarly, all machines are set up with identical options for tools, tool builds, speeds and feeds. Providing consistency, these measures also facilitate a smooth process when CAD files are received from a client, usually in Step or IGES format.

The majority of Freeform Technology’s business is the manufacture of patterns for carbon fiber components. The turnaround from CAD model to a finished pattern ready for molding can sometimes be achieved in just 24 hours. All patterns are custom-made by Freeform Technology, which has a team of dedicated offline programmers. What they write one day will be on the machine later that day or the day after.



*“With Siemens Digital Industries Software’s solutions, we can consistently offer our customers the very best quality, absolute accuracy and the tightest turnaround time.”*

Fred Hutton  
Director  
Freeform Technology

The company completes up to 50 patterns a day at its busiest times. Freeform Technology also has the capability to produce aluminum molds according to customer requirements.

One time-saving feature of NX that is particularly beneficial to Freeform Technology is the capacity to program one side, and then choose to regenerate the model in mirror image. As most cars have matching

left- and right-hand side components, this not only saves programming time, it means that partner components can be loaded on two separate machines at the same time.

**Flexibility and control**

Because Burchett and Hutton began their business by doing everything themselves, they are especially cognizant of the need to maintain the highest quality throughout

**“I have yet to find a problem I have not solved with NX CAM.”**

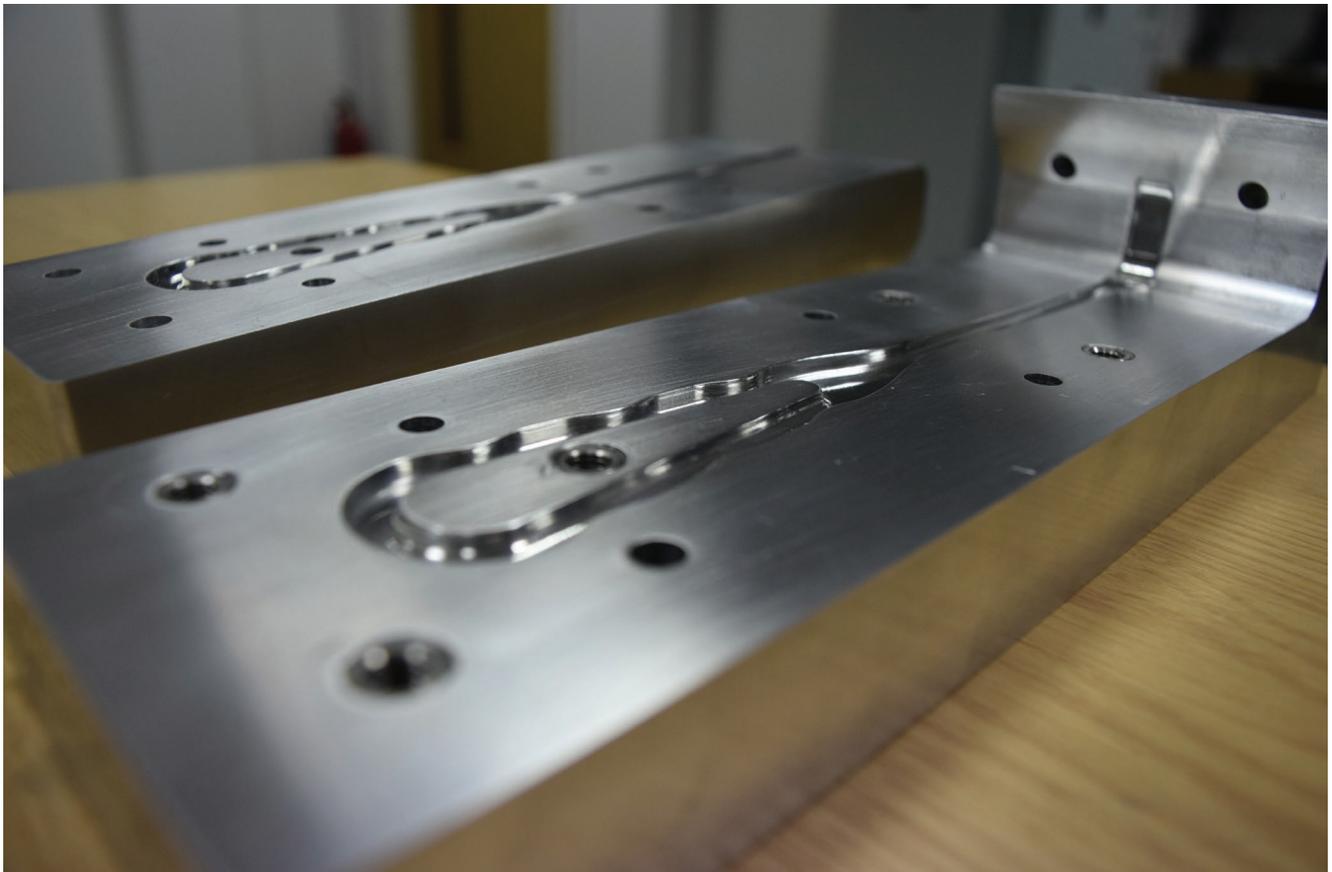
Simon Burchett  
Director  
Freeform Technology

the tooling process. Here, Burchett particularly values the flexibility of NX. “With some software applications, you simply cannot do what you want to do. I think that’s because purpose-built CAM packages are designed to be used very quickly by anyone. They have an easy-to-use interface and, at the click of a button, the machine is off. The trouble with this is that the software drives the toolpaths; the machinist has little control. With NX, we have a lot more input into how each toolpath is created.” This is critical when there are potential issues to anticipate and address, such as a complex design that requires the manipulation of toolpaths in order to remove as much material as efficiently possible.

The flexibility provided by NX supports the team when they tackle unusual or

unconventional tooling challenges, like a recent project to create molds and tooling for silicon body parts for use in medical training. Burchett explains, “That particular client was extremely impressed by the quality of our work, and that’s partly because NX is very versatile to use. The postprocessors can be used to drive any machine to any specification. Even though I have investigated other software, I often found it limiting. I have yet to find a problem I have not solved with NX CAM.”

Once toolpaths are created using NX, a specialist interface provided by Siemens Digital Industries Software enables the programmers to export the NX CAD models to a simulation program that mimics what the machine does in order to verify the toolpaths. This process confirms that there are no potential issues, such as collision or over travel.



## Solutions/Services

NX  
siemens.com/nx

## Customer's primary business

Freeform Technology combines a quality-focused ethos with highly skilled staff and sophisticated machining equipment. Applying Formula 1 motorsport standards to the composites industry, the company prides itself on meeting the most demanding requirements, and delivering tooling and components on time and according to specification.  
www.freeformtechnology.co.uk

## Customer location

Buckingham  
United Kingdom

## Solution Provider Partner

OnePLM  
www.oneplm.com

## A digital company with a single source of data

Serving the Formula 1 industry has its drawbacks. Pressure is particularly intense in the run-up to the racing season as teams finalize designs. "As we mature, business becomes more on our terms, and we are using NX to support diversification," notes Burchett.

Freeform Technology's strategy is to continue growing the business in motorsports and respond to demand from new sectors, such as aerospace, defense, energy, leisure, marine, medical, and oil and gas. Although existing clients supply their own data, the two directors are offering additional services, including adding powerful design services using NX CAD. "Previously, we subcontracted to specialists when clients needed significant CAD input, but it is more efficient to bring it in-house, especially for complex designs. We have more control over the manufacturing process and can focus on reducing our clients' costs."

For Burchett, the key is to expand without losing focus on quality and delivery, because that has underpinned the company's success to date. "NX is fundamental to

our operation; the next step is to implement Teamcenter for complete lifecycle management. Together, they will help us stay on top, as well as see what else we can offer." Because speed of response is so critical to Freeform Technology, OnePLM has focused on the core functionality of Teamcenter® software and prepared a deployment designed to take only five days, which includes two days of implementation and three days of training.

Burchett notes, "Our ultimate goal is to be a paperless company, with a single source of digital data that everyone shares for design, tooling and shop documentation, so whenever we update a toolpath we are all working on the latest data. Having NX as our PLM platform means we can extend our capability. In the future, we may also look at analyzing components."

Hutton summarizes, "Being a customer of Siemens Digital Industries Software gives us an opportunity to be ahead of the game with regard to our competition. With Siemens Digital Industries Software's solutions, we can consistently offer our customers the very best quality, absolute accuracy and the tightest turnaround time."

*"As we mature, business becomes more on our terms, and we are using NX to support diversification."*

Simon Burchett  
Director  
Freeform Technology

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