Vericut

ELE Advanced Technologies

20% Tool cost savings with Vericut Force

User Story

ELE Advanced Technologies, a leading UK manufacturer of turbine parts for the aerospace and power generation sectors, is tapping into the benefits of Vericut Force software to reduce its cost of consumables (cutting tools) by an impressive 20% per component. This is in addition to cycle time reductions of 11%. Together, these savings mean ELE Advanced Technologies is on track to achieve a return on investment (ROI) of less than 12 months, keeping ELE competitive with key customers by mitigating the current economic environment where manufacturing inflation & cost pressures remain high.

With its state-of-the-art, 180-employee headquarters and manufacturing facility in Nelson, Lancashire, ELE Advanced Technologies has grown considerably from its origins in 1955 supplying parts to local industry. Today, the tier-one supplier's global customer base includes blue-chip multinationals such as Rolls-Royce, Safran, GE Aerospace and Siemens.

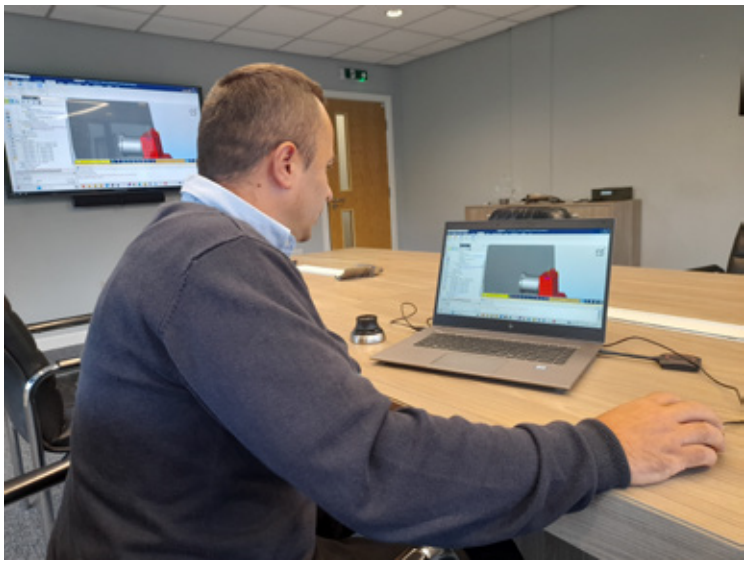
Privately owned since a management buyout in 2000, business is currently strong at ELE Advanced Technologies, where adjoining land allocated to support further growth could soon come into play. The current site in Nelson has been home for the past three years, initially providing an extra 40% of shop-floor space. However, heavy investment quickly saw the space filled.

Multinational facilities

While the UK facility produces hot gas path products such as turbine blades, nozzle guide vanes and seal segments, the circa £25 million turnover company has an additional 40-employee facility in Slovakia that is responsible for parts like turbine housings. Components manufactured by ELE Advanced Technologies extend in size 25 to 1,000 mm long, spanning all turbine needs for the aerospace and power generation sectors and providing notable market differentiation.

"We have many niche processes aligned to turbine part manufacture, such as STEM drilling [nitric acid erosion], capillary drilling and fast-hole EDM drilling," explains Technical Director David Dudley. "There's also creep-feed grinding, twin-wheel grinding and VIPER grinding on our 50,000 ft² shop floor, alongside several EDM machines and four-axis horizontal machining centres. We work a three-shift, 24-5 system on weekdays, plus a weekend shift."

ELE Advanced Technologies is a long-standing user of Autodesk PowerMILL 3D CAM software and Vericut verification software, the latter helping to avoid collisions and protect both expensive machines and components.

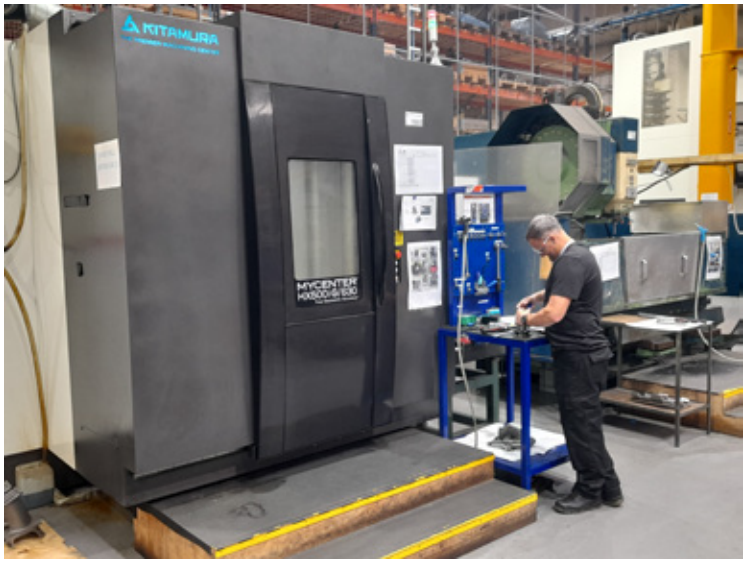


"Our team of manufacturing engineers added the Vericut Force module in summer 2025 as we were looking to reduce the cost of our consumables," says David Dudley. "We're seeing year-on-year cost rises passed on by our suppliers, while we also experience pressure to provide customers with cost reductions. We knew Vericut Force could offset some of these cost challenges through cycle time reductions and, more significantly, by extending tool life."

Exotic alloys

For its rough milling processes, ELE Advanced Technologies relies heavily on special solid-carbide cutters designed to machine exotic metals like nickel-based superalloys and titanium. These engineering materials feature properties that help withstand the extreme operating temperatures of a gas turbine engine. However, the same characteristics make them extremely challenging to machine.

"We invited Vericut to deliver a Force presentation at our premises," says David Dudley. "However, it sounded too good to be true, so we requested a trial of Force on a key component – a part designed for one of the largest IGT engines in the world."



The component is machined from exotic alloy on a Kitamura Mycenter HX550iG four-axis horizontal machining centre. It features a long cycle time and carries high consumable cost, with several cutters typically requiring replacement before part completion.

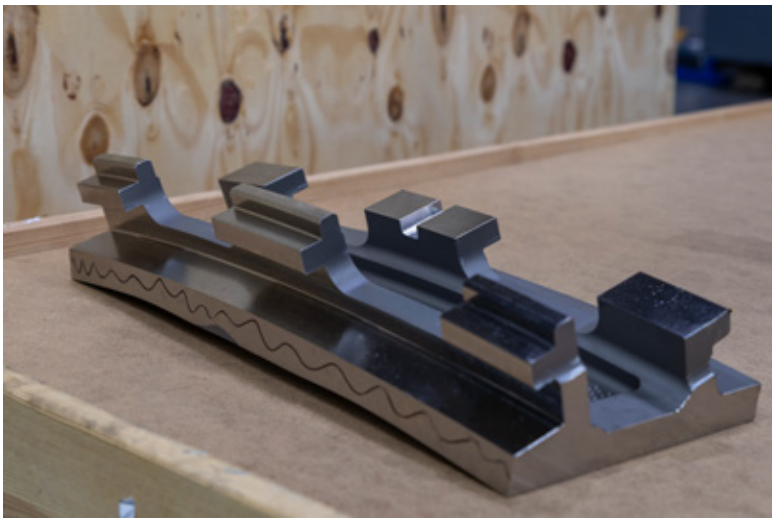
After just two days of training, indicating the software's ease of use and shallow learning curve, ELE Advanced Technologies applied Vericut Force to its component.

Vericut

Baki Huna, Senior Manufacturing Engineer at ELE Advanced Technologies, takes up the story: “The great thing about Vericut Force is that you have a choice. You can reduce cycle time OR increase tool life, OR find an agreeable balance. For this component, reducing the cost of consumables was paramount, so we were delighted to find that Vericut Force delivered up to 20% saving in tooling costs on some products. As the cutters to machine these exotic materials are expensive, it’s a significant reduction, particularly when multiplied over potentially thousands of components every year. Vericut Force also provided a cycle time saving of 11.2%.”

Force of nature

Most CAM systems do not adjust for changing cutting conditions. In particular, they fail to compensate for chip thinning. Chip thickness is the most important parameter when machining, not feeds and speeds, as many assume. Vericut Force automatically adjusts chip thickness for each tool operation using Vericut-calibrated materials and cut-by-cut tool engagement analysis. Force keeps the chip thickness as constant as possible by adjusting feed rates, block by block of NC code, even adding blocks if necessary to deliver ideal cutting. The result? Shorter cycle times and/or longer tool life.



Importantly, all of this is achievable without any compromise in quality, a vital factor for ELE Advanced Technologies and its customers. The company prides itself on the consistent delivery of high-quality products, carrying both AS 9100 and ISO 9001 quality management certifications. ELE is also NADCAP-approved for NCM (Non-Conventional Machining) and NDT (Non-Destructive Testing).

Sustainable way forward

Further advantages of applying Vericut Force to the component at ELE Advanced Technologies include better sustainability through longer lasting tools. The company is committed to driving sustainability and working towards net-zero targets, both in its day-to-day operations and the products it delivers. Furthermore, Vericut Force provides a better overall process as it

is now unnecessary to stop the program for tool checks, while the toolholders no longer sustain damage due to worn cutters.

“We estimate ROI for Vericut Force at less than 12 months,” states David Dudley. “Our team of manufacturing engineers is now applying Force to several other milled components that currently demonstrate long cycle times and/or high consumable use.”

Potentially, all milled components at ELE could ultimately benefit, including graphite electrodes required by die-sink EDM processes.

“We currently have three machines on site for this purpose,” he says. “Vericut Force will help reduce cycle times and free-up capacity on these busy machines, subsequently avoiding the need to invest in another. We’re currently doing everything we can to meet rising market demand for additional capacity, but spending our way out of it with new machines or more floor space is expensive. Force provides a far more cost-effective solution. It also demonstrates to customers that we’re proactive and innovative about alleviating cost pressures from suppliers while avoiding the need to increase prices.”