

Geared up for the future!

New wire EDM machine tool investment opens up business opportunities for leading precision gear and transmission component manufacturing specialist.



Gibbs Gears, based in Stoke Mandeville, has recently invested in its first wire EDM machine - a new high-performance AgieCharmilles CUT 300mS from GF Machining Solutions.

The machine, installed at the company's 20,000sq ft facility in March 2014, was purchased specifically to help Gibbs Gears exploit the growing market for the manufacture of low volume non-standard gears, as well as providing customers with a cost-effective and quick turnaround concept and pre-production solution for the machining of prototype and pre-production gears and transmission components.

Gibbs Gears, established in 1954, manufactures and supplies high-performance, high-precision gears to the UK and worldwide markets.

The company manufactures comprehensive standard gear solutions that are used and specified across a diverse range of industry sectors i.e. aerospace, motorsport, medical, marine, power generation, oil and gas etc., and that includes spur and helical, spline shafts, gear racks, pinions, worms and wheels, spiral & straight bevels gears, gear box & gearbox assemblies.

Over recent years the company has experienced a steady increase in demand for low-volume non-standard gears and/or the production of prototypes.

Explains managing director, Reece Garrod:

"More and more UK and international customers are approaching us to see if we can manufacture non-standard pitch and pressure angle gears. Such requests, certainly in the past, were problematic to us and to the customer especially if their manufacture couldn't be achieved using the conventional 'gear' cutting tools we held in stock.

“This meant, especially if and where the quantities required were low, that the cost of producing bespoke tooling combined with the often long manufacturing lead times involved, made such non-standard jobs uneconomically viable.”

“The investment in the new CUT 300mS means we can provide customers with a rapid and cost-effective response by wire EDM machining the gear form...thereby negating the need for specialised (and expensive) tooling.”

It's a similar situation with the manufacture of prototypes where volumes are again typically low and where, because of potentially frequent design changes and modifications made to the original prototype, tooling budgets are not fixed or even known.

Continues Reece Garrod:

“Prototype projects are important to the future of the company. However, prototype production and development is often time intensive and can impact on our production resources and capacity.

“Our ambition to provide customers with a world-class, one-stop prototype gear design and development manufacturing service was a major catalyst in investigating the potential of wire EDM technology and ultimately in investing in the CUT 300mS machine.”

In-house versus subcontracting

Manufacturing companies adopting new technologies may choose to subcontract out the service rather than bringing the capability in-house.

Explains sales manager, Philip Maurice:

“Out-sourcing can appear attractive at first glance. There is no large capital outlay and interruptions to existing manufacturing operations (and hence productivity) can be managed and kept to a minimum.

“However, subcontracting has its dangers in that control over quality and delivery times is effectively relinquished to a third party.”

“We took the long-term view, and decided that we would maintain control over all our means of production...and that meant that we were in the market for a new wire EDM machine.”

The CUT 300mS

The AgieCharmilles CUT 300mS is a versatile, high-performance and high-precision machine equipped with a powerful digital CC generator for fast cutting speeds and exceptional surface finishes (Ra 0.1µm), and an active thermo-stabilisation system delivering 3µm accuracy and improved process reliability.

The machine features GF Machining Solutions' TAPER-EXPERT system and unique Quadrax® design (crossed double guiding of the X, Y, U and V-axes) for machining large tapers, and its AWT (Automatic Wire Thread) system ensures trouble-free unattended and lights-out operations.

Explains Reece Garrod:

“We liked the look and specification of the CUT 300mS.

“Specific strengths included the machine's taper cutting capability (capable of machining 45 degree cones); its CC generator which virtually eliminates the creation of the re-cast layer; and its on-board gear cutting software package option.

“The machine's price, quick availability and performance in cutting trials combined with GF Machining Solutions' understanding of our needs and requirements – all contributed to us deciding on the CUT 300mS.”

Gibbs Gears' EDM manufacturing operation

Since being installed the CUT 300mS has been used to machine internal and external spur and helical gears, and standard and non-standard internal splines and keyways.

The new machine also enables the company to wire cut rough gear forms in their pre-hardened state and finish the parts post heat treatment. For small batch work this capability is particularly cost-effective as it negates the need to invest in costly grinding equipment and processes for post heat treatment operations.

Training was carried out at the GF Machining Solutions' facility in Coventry, and Gibbs Gears chose two of their younger members of staff to be trained rather than more experienced employees.

Dominic, a product of Gibbs Gears' successful apprenticeship scheme, is 22 and is now currently working towards his HNC in Mechanical Engineering. Third year apprentice Josh, aged 20, is working towards NVQ level 3 with training partner ATG based in Aylesbury. Gibbs Gears currently has five apprentices at different qualification stages, and plans to take on at least two more apprentices in September.

Peter Kelly, Production Manager confirmed, "GF did a great job with the training. The guys were a little nervous at first being thrown in at the deep end but they really enjoyed the experience and when the machine was installed they jumped straight in and had parts coming off within hours. We gave Dom and Josh the opportunity to stretch themselves. They already had a good knowledge of conventional gear manufacturing techniques and did well to apply this to a new process".