

Problem solved at E H Thompson - with help from WNT



For a long-established machine shop, EH Thompson, which trades as Thompson Precision Engineering, doesn't think of itself as an engineering business, but more of an industrial problem solver. While undertaking what may be classed as general sub-contract work, the company, founded in 1939 as a specialist scientific instrument maker, developed to specialise in project-based work taking on design, machining and finishing of a wide range of components and assemblies that others thought impossible.

This ability to solve problems is hard-wired into Thompson Precision Engineering, as no sooner had it started business manufacturing scientific instruments it had to turn its skills to manufacturing munitions and other defence hardware as World War Two took hold. Once hostilities ended the need to replace this volume production saw it become a key supplier to Ford Motor Company. The manufacture of automotive and then high pressure hydraulic systems continued until the 1980s when the 'global economy' raised its head. The volume business started to erode and attention shifted to high precision aerospace manufacture, focussed on safety critical parts. As part of this work it sub-contracted work to JH May, a pattern maker and prototyping specialist, which it purchased in 2003.

"The resulting business combines the best of high precision engineering and bespoke project manufacturing with an enthusiastic and entrepreneurial spirit that allows us to work with larger companies and bypass the issues that they have in terms of getting things done quickly," says EH Thompson Managing Director, Simon Terry. "Many of our customers rely on us to confirm that their design concepts are feasible to manufacture. As a result we get most of our enquiries from design offices rather than procurement and this develops into trusted relationships that go in both directions"

Highlighting Thompson Precision Engineering's versatility and ingenuity it is currently working on two projects that couldn't be more diverse, but that make full use of their engineering and bespoke project expertise. One is a commission to build a full size replica of the Lockheed 5B Vega used by Amelia Earhart in 1932 to fly across the Atlantic Ocean and then non-stop across the United States. This replica will be a composite of wood, fibre glass and aluminium and will eventually be hung, on display, 30 feet above the ground. The second current project is more engineering-based with a project to machine a series of architectural elements. The main constraints were intricate cutter paths and the customer specification that the parts be machined from solid 316 stainless steel billets, the largest of which weighs in at 3 tonnes, with just 0.5 tonnes remaining once machining is complete! With such large volumes of material being removed, and the high value of the parts being

machined, a review of milling strategies was called for and EH Thompson turned to WNT for assistance.

“The roughing cycle for the largest piece involves many 100’s of hours cutting and on top of that we have a series of single finishing cycles each of 100 plus hours to contend with. This means we need confidence in the cutters to be able to operate lights out,” says Ian Cain, EH Thompson’s Production Manager. Another challenge in machining these pieces was the tool extensions that were required. For the rough machining the button-style cutters had to have a gauge length of 250 mm and for finishing this had to be extended to 350 mm. Working with WNT’s Technical Sales Engineer, Adam Cross, a machining strategy was developed that would allow lights-out machining making use of sister tooling. “Tool life was the key in this project, more to the point consistent tool life. We had to know that the cutters would last a certain amount of time in order that we could have the confidence to leave the machine running unmanned, which is not often done on materials such as 316 stainless, but the length of the roughing and finishing cycles demanded it. Working with Adam we achieved this and while we were not chasing seconds on cycle time we still achieved very competitive performance with WNT’s help for such a testing application”.

On both the roughing and finishing operations WNT selected its Dragonskin HCN 5235 grade of indexable inserts, which is capable of delivering significant cycle time reductions on stainless steel and heat resistant alloys. Machining times are being cut by as much as 40 per cent, with tool life increases of 50 per cent being reported across a range of applications. “With cycle time being less of a priority we focussed on getting tool life to a point that we were happy with. That said, using the WNT System 2510 RS 100 mm diameter button cutters with RPHX 1204M8EN-M31 HCN 5235 inserts we achieved cutting data of 186 m/min with a feed/tooth of 0.35mm. To assist with the tool life we also ran the cutters dry, as applying coolant would have introduced an element of thermal shocking that would have reduced the life of the inserts,” says Adam Cross.

For the finishing operation a WNT System K 2000 32 mm copy milling cutter was used with ROHX 3250 R16-FM3 WAN2210 inserts. The tool life for these cutters on the finishing cuts was incredibly good, running at 200 m/min surface speed and 0.15mm/tooth feedrate. The tool assemblies are a mixture of BT40/50 and HSK to suit the variety of spindles available at EH Thompson. The surface finish of the end product is very important so the quality achieved during the final machining operation has to be exceptional. The tools have to be super accurate, in terms of set-up, as E H Thompson can’t risk any mismatch when sister tooling is called up. This all formed part of the support provided by WNT.

“This project is typical of what we achieve on a regular basis here at Thompson Precision Engineering. The partnership with WNT ensures that we achieve the machining criteria needed to deliver the parts to specification, alongside our policy to invest in the best tooling, software and plant for the job. In this case we purchased a brand new EC1600 horizontal machining centre from Haas in order to ensure we had the machining capacity. Much of our business now comes from existing customers and word of mouth. We have a reputation as innovative engineers who can apply

our knowledge to solve complex problems. We are repaid by winning exciting and interesting engineering conundrums such as this," says Simon Terry.