OPTIMUM GROUP of COMPANIES – CASE STUDY

How Houghton's Hocut 4940 Enabled a Customer to Increase Revenues & Margins

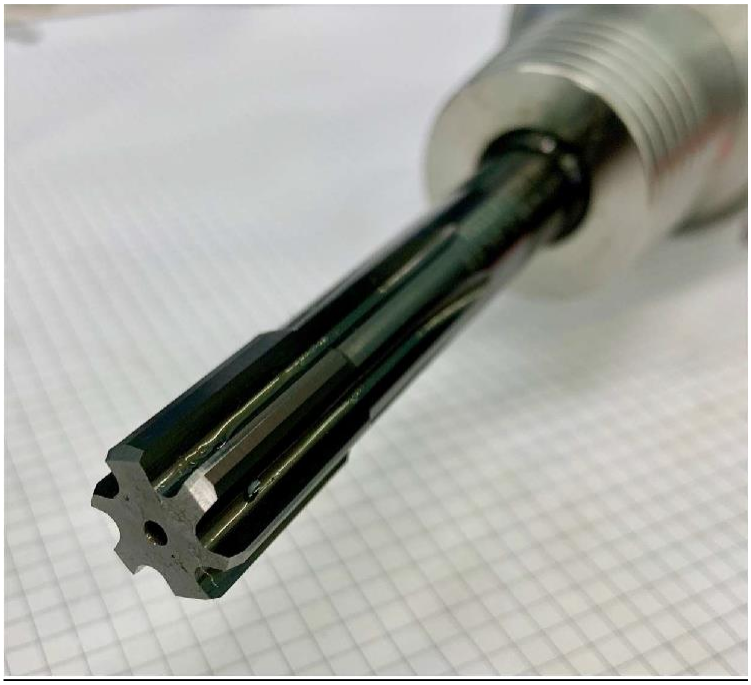
What was the situation? (Market Segment, Application, Machine/Equipment, Materials, Tooling, Filtration, Services etc) A Precision Engineering Component Manufacturer in the North West of England received an enquiry for Valve Body machining in Aluminium 2011 – T6, a 5% copper alloyed material with typical tensile strength of 310 MPa and Rockwell Hardness of 110 HB and a sample batch was underway to demonstrate conformance to specification for a potential gain of a large order.

The machine selected to conduct the machining was a Mori Seiki NH 400 DCG CNC Machining Centre with a system capacity of 550 Ltrs complete with a filter conveyor and 70 bar high pressure pumping system.

The customer resides in a water quality area of 6^0 dH (circa 100 ppm CaCO3)

What was the problem? (Explain the problem and where possible the process in determining the root cause to the problem)

During the set up of the sample batch it became quickly evident that the customer could not achieve surface finish of the main bore which was the most critical part of the process using a major coolant brand. The drawing tolerance required 0.4 Ra Max. and were achieving well in excess of 0.4 to 0.8 on a solid straight fluted Carbide Reamer with through spindle coolant delivery. The lower value only happened after greasing the solid reamer to aid lubrication after every 2 or 3 parts. At this point the concentration was lifted to 16% but still with not the desired outcome. The bore length is 46 mm with a finished diameter of 14.98 mm from a pre-drilled hole diameter of 14.70 mm.



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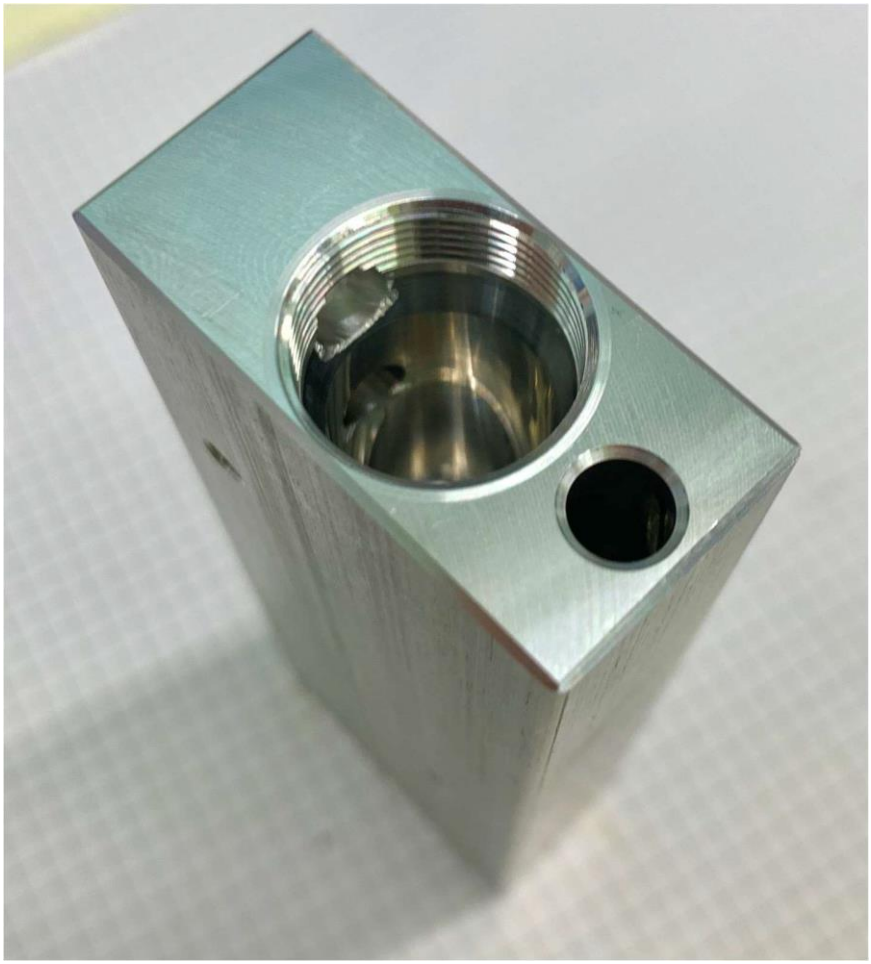
Optimum whom is a long-standing supplier of neat cutting oils to this customer was offered the opportunity on this and other problem areas where machinability performance was questioned by the customer.

What was the solution? (Details of our proposal or recommendation)

After reviewing the application it was decided to trial Houghton Hocut 4940 is an advanced, high lubricity, boron-free and formaldehyde-free emulsion technology giving very long sump-life. A special additive package gives greatly enhanced machining performance compared to conventional products and is particularly effective on difficult aerospace materials including aluminium, nickel and titanium alloys.

The system was deep cleaned and sterilised before trial commencement and filled to 10% with a working range between 9 – 11%. Immediately the customer showed signs of improvement on surface finish without the need of greasing the reamer and solely relying on the performance of the coolant and following a machining run returned surface finishes between 0.2 – 0.3 Ra. Tool Life, even after re-grinds is approx. 3000 components.



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How was the solution Implemented? (Include what we did as a service to the customer)

Regular weekly monitoring followed the coolant trial for Concentration and pH checks with the occasional sample for lab analysis to determine the levels of contaminants. The coolant has not been changed following 16 months of service demonstrating excellent emulsion and pH stability.

How did the Customer benefit? (Quantify savings in OEE, maintenance & repair, people, indirect materials & improvements in HSE etc)

The customer was awarded the business just weeks after the initial batch trial with increased revenues and margins.

What was the conclusion?

Hocut 4940 has been recognised by the customer as an enabler to taking on business that before may have been beyond them in machining capability using waterbased coolants. Following further successful trials at this customer demonstrating additional added value with Hocut 4940 Optimum has managed to replace all 40 machines previously on the master brand coolant.