

Aerospace Fuel System Machining : Improved Surface Finish and Reduced Cycle Time

HOCUT® 795 B

The Challenge

A plant in the UK is part of a large global industrial group and manufactures fuel systems for military and civil aircrafts. Most aerospace materials are machined including L111 and 7075 aluminum alloys, titanium, and high alloy steels. Hitachi Seiki, Boehringer, Hardinge and Traub machine tools carry out turning, milling, drilling and tapping operations.

The plant was using 4 coolants, from four different competitors. However, the customer had a wide range of coolant issues:

- Poor stability of coolant caused by bacteria and fungal contamination
- Hard water soap formation
- Severe foaming on high pressure machines
- Staining of aluminum alloys
- Short sump life, as little as one month for some machines
- Skin and respiratory complaints

The Solution

After a plant survey of machine tools, processes, materials and water conditions, HOCUT® 795 B was proposed supported by independent performance data on similar operations from other aerospace components manufacturers.

Agreement was reached with production team leaders for trials on one machine in each cell after which comparative results against competitor products were collected and presented to the plant decision makers.

The trials were supported by regular weekly visits from a QH FLUIDCARE™ Service Technician to monitor and control the fluid in use. Trials were a complete success and the plant quickly converted all machines.

First, a 400% improvement in tap life eliminated the need for an extra hand tapping operation on some aluminum parts. Second, the aluminum surface finish was so good that a final polishing operation could be eliminated completely.

The Benefits

- Aluminum staining eliminated, reducing defects by 50% for some parts
- Improved surface finish has eliminated polishing operation on L111 alloy parts
- 400% improvement in tap-life has eliminated hand tapping operations on aluminum parts
- Sump life increased, in some cases from just one month to more than six months
- Reduced waste due to fewer clean outs
- No bacteria or fungus and pH levels steady at 9.0-9.2
- Bad odors, foam, hard water soaps and greasy residues eliminated
- Top-ups strength reduced from 4% to 1%
- Concentrate usage reduced by 20% due to less top-up and fewer new fills
- No operator health issues since changeover
- Four coolants reduced to one

The Product

HOCUT® 795 B is a versatile, heavy duty, chlorine-free, soluble metal removal fluid specially formulated to machine Aerospace grade aluminum alloys. HOCUT® 795 B is compatible with hard water, clean running and bio-stable assuring long, odor-free sump life. It provides high corrosion protection without staining. HOCUT® 795 B is approved for all usage areas defined in BAC-5008, NASA, Sikorsky Helicopter, UTC Aerospace, Vought Aerospace, Pratt & Whitney and Bombardier.

