CASE STUDY

Non-Ferrous Machining :
30% Consumption Reduction & Superior Biostability

QUAKERCOOL® 7450

The Challenge

A major Tier II supplier to the automotive industry was experiencing coolant issues machining aluminum balance shaft housings. The manufacturer was using a standard high oil, semi-synthetic metalworking fluid for their turning, milling, and boring operations but were unhappy with the poor service, low tool life, high usage and bacteria issues. The customer desired a superior technology, enhanced on-site technical support as well as:

- Increase tool life
- Reduce usage
- Eliminate bacteria without the use of additives
- Decrease misting and foam
- Improve operator acceptance

The Solution

Quaker Houghton reviewed the issues the customer was facing and recommended QUAKERCOOL® 7450. This high-performance microemulsion was chosen because of its versatility to machine both ferrous and non-ferrous metals, is non-foaming, and has superior biostability. The machining capabilities of this product have been proven extensively in Quaker Houghton's CNC machining center and endorsed by customers who are benefitting from this field proven technology.

The outcome of the trial was excellent. For one month the customer ran QUAKERCOOL®7450 in one machine and from the very first part machined, the customer had no issues. The customer gained confidence that QUAKERCOOL® 7450 did not need to be used at a 20% concentration like the previous coolant but rather at 8%.

Due to the design of the machines (one machine doing multiple operations) the tools wear out at different times so the customer has always used "block tool changes"—all the tools changed at the same time. As a proof of principle during the trial, the customer agreed to run one tool to failure; the tool would normally be changed after 100 parts and be in poor condition. After three trials, the average tool life increased by 35%, a number that was an eye opener for the customer. Although they decided to stay with the block tool change at 100 parts they are now aware of the possibilities of increasing tool life.

Productivity has improved by less machine down time for maintenance, premature tool changes and premature coolant cleanouts. Although the plant does not measure how much water is added to each machine they have noted that there is less carryout and longer sump life which would indicate less water usage. Less coolant drag out has been noticed by the customer and it is very evident in the chip hoppers that very little coolant is being dragged out.

CREATING SUSTAINABLE VALUE

Quaker Houghton focuses on providing customer solutions that reduce waste, energy, water usage and chemical consumption, while improving operational processes, tool life and the health and safety of workers. We are committed to creating a positive social, environmental and economic impact on our world. By converting to QUAKERCOOL® 7450, bacteria, odor, misting and foam were eliminated which supports a safer and cleaner working environment for operators. Consumption was dramatically reduced as well as drag out, lowering chemical and water usage and the customer's environmental footprint. Also, decreasing air-entrainment improves tool life and has a positive impact on energy use.

Process and Equipment

Part	Balance shaft housing
Material	A 380 Aluminum
Machine	10 Makino Machines
System Size	800 Liters
Water Hardness	120 ppm
Concentration	Competitive Coolant 20% QUAKERCOOL® 7450 8%
Operation	Turning, drilling, boring
Filtration	Chain drag

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The Benefits

By switching to QUAKERCOOL® 7450, the customer realized the following benefits:

- Foam in the machines can lead to poor tool life and housekeeping concerns but QUAKERCOOL® 7450 has put an end to all foam concerns.
- Entrained air had been a major issue for the customer while machining aluminum. There is very little quiet time for the coolant so it is imperative the coolant release the air as fast as possible. This attribute of the QUAKERCOOL® 7450 air is one of the main reasons this product was chosen.
- No operator issues and tool life met or exceeded all expectations.
- Biostability was a constant concern with the previous coolant. Odors, short sump life and operator complaints were constant. There has been no biostability issues with QUAKERCOOL® 7450 in two years.
- Consumption dropped by 30%. This was accomplished by less carryout, running at a much lower concentration as opposed to the previous coolant and Quaker Houghton monitoring the concentration

Customer Testimonial

Approximately two years ago we switched all of our CNC Machining Centers and CNC Lathes over to QUAKERCOOL® 7450. Since the change we have eliminated all of our issues including bacteria odors and growths, foaming, pre-mature charging of the machines due to poor performance of previous product. The QUAKERCOOL® 7450 is being used in various machining applications such as turning, drilling, boring, and in various materials used for steel forgings and Die Cast Aluminum. One of the applications that really stood out was the performance of the coolant on the machining of aluminum with PCD padded tools. Our change has been very rewarding with using 30% less product, fewer hours of machine maintenance, and overall performance of the product itself. We are very satisfied with the product along with the knowledgeable and routine services provided by Quaker Houghton and their personnel.

- VICE PRESIDENT, MANUFACTURING

The Product

QUAKERCOOL® 7450 is a high-performance, formaldehyde and boron free microemulsion ideally suited to all operations on aluminum and ferrous alloys demanding premium surface finish quality and consistent lubrication. QUAKERCOOL® 7450 is myco bacteria resistant and contains enhanced biostability to extend sump life and minimize strong odors.

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