

## Machining and Grinding: 50% Reduction of the Coolant Consumption Due to Better Coolant Lifetime

QUAKERCOOL® 7200 HBFF

### The Challenge

A leading German die casting company experienced problems related to their metalworking coolant and service from the supplier. The die caster produces automotive modules, home appliances and consumer goods from aluminum, magnesium and zinc with decorative surfaces, and was looking to alleviate the following problems:

- Skin irritation
- Bacterial problems
- Low coolant lifetime
- Coolant containing Boron and Formaldehyde

### The Solution

Quaker Houghton visited the most critical plant located in Czech Republic which was never visited by the competitor. As a result of the visit, Quaker Houghton introduced QUAKERCOOL® 7200 HBFF after performing compatibility tests with different polish pastes, cleaners, electroplating, etc. The product was recommended based on the following advantages:

- Formaldehyde releaser free
- Boron free
- Excellent bio-resistance
- Cleanliness of tools/machinery even on cast iron in hard water
- Excellent corrosion protection

Beginning in November 2012 thru June 2013, QUAKERCOOL® 7200 HBFF was gradually introduced into machines located in Germany and Czech Republic.

### The Benefits

At the end of the trial, the customer realized the following results:

- 10% lowered total cost from the competitor
- 50% reduction of the coolant consumption due to better coolant lifetime in Czech Republic plant
- Improved biostability of the coolant over the competitor
- Elimination of skin irritation
- Elimination of bacteria related problems

### Process and Equipment

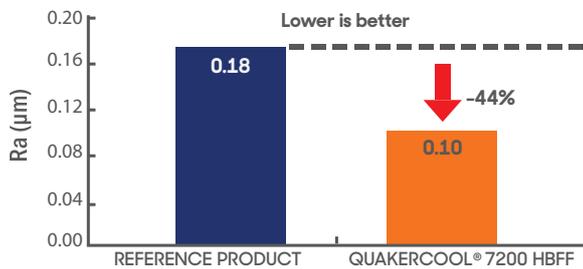
PRODUCT TITLE	PRODUCT INFORMATION
Material	Diecast Aluminum, Magnesium and Zinc
Concentration	6 to 8 %
Water Hardness	10 °dH / 18 °F / TH 180 ppm
Machines	Milling/Drilling
Machines	> than 20 Haas and Chiron machines
System Size	200-300 litres tank capacity

### The Product

QUAKERCOOL® 7200 HBFF is a high performance micro-emulsion ideally suited to all operations where high surface finish quality and high lubrication is needed. It is ideal for general purpose machining of most engineering materials. QUAKERCOOL® 7200 HBFF is well suited for difficult metalworking operations on cast iron, steel and aluminum. The concentration range is recommended to be between 4 - 10% depending on type of operation.



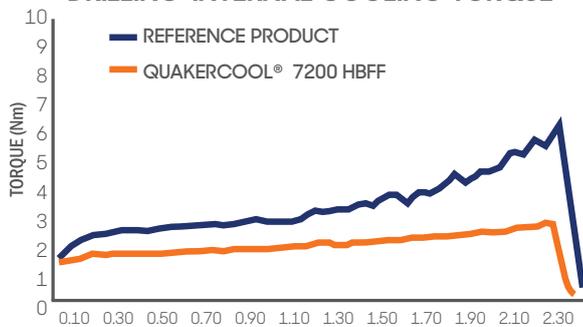
### STRAIGHT FLUTE RAMING ROUGHNESS AVERAGE (Ra)



1. Roughness measurements in straight flute reaming on aluminum alloy (AlSi7Mg)

Single step through hole on a CNC vertical milling center  
Diameter: 10.2mm - Depth: 44mm - Cutting speed: 20m/mn -  
Spindle speed: 625 rpm - Feed: 0.25 mm/rot

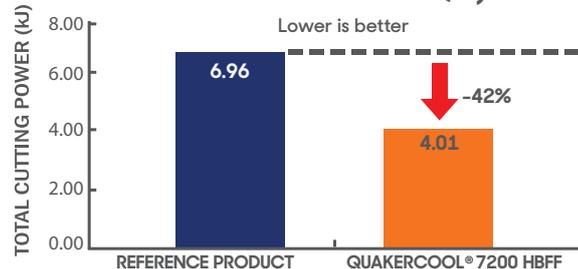
### DRILLING-INTERNAL COOLING TORQUE



2. Forces measurement in drilling operation on aluminum alloy (AlSi7Mg)

Single step through hole on a CNC vertical milling center  
Diameter: 10.2mm - Depth: 44mm - Cutting speed: 20m/mn -  
Spindle speed: 625 rpm - Feed: 0.25 mm/rot

### DRILLING - INTERNAL COOLING TOTAL CUTTING POWER (kJ)



3. Cutting power measurement in drilling operation on aluminum alloy (AlSi7Mg)

Single step through hole on a CNC vertical milling center  
Diameter: 9.8mm - Depth: 38mm - Cutting speed: 200m/mn -  
Spindle speed: 6500 rpm - Feed: 0.15 mm/rot - internal cooling

