Milling

QUAKERAL® 370

CASE STUDY

AEROSPACE INDUSTRY

Challenges

A major aerospace engine manufacturer produces titanium turbine blades for military aircraft in a high-speed machining cell of Makino. From day one, they worked with a competitor's product in demineralized water. The main problems were:

- Surface cleanliness (stickiness)
- Foam problems
- Insufficient tool life
- Excessive coolant usage
- Dirt/swarf build-up
- Unacceptable chemical treatment costs

Quaker introduced QUAKERAL® 370, a chlorine-free product based on Quaker's proprietary ester and emulsification technology.

Providing Solutions

The use of QUAKERAL® 370 resulted in savings equal to 13 times the annual coolant costs.

€ / year	Before	After	Savings
Coolant Consumption	26,394	11,850	14,544
Water Consumption	15,381	8,400	6,981
Tooling	312,000	296,400	15,600
Inspection/ Quality	14,200	7,100	7,100
Disposal	15,888	0	15,888
Cleanliness	450	0	450
Productivity	94,500	430 hrs production gained	94,500
TOTAL	478,813	323,750	155,063

Other benefits that came with the introduction of QUAKERAL® 370:

- Environmental compliance
- Zero waste due to the absence of emulsion changes
- Easy operator acceptance

Customer Reference

- Bosch
- Caterpillar
- Cummins
- Chrysler
- Delphi
- Federal Mogul
- Ford
- GM
- INA Bearing
- Koyo
- Pratt & Whitney
- PSA
- Renault
- Toyota
- Volkswagen
- ZF Corp

OEM Reference

- Alfing
- Deckel
- Excello
- Gehring
- Giddings
- Grob
- Heller
- Honsberg
- Lamb
- Makino
- Mapal
- Mazak
- Mollart
- Nagel
- Toyota
- Varinelli

Product Description

QUAKERAL® 370 is based on advanced ester technology and suitable for machining titanium, aluminium, steel, alloy steels and cast iron. QUAKERAL® 370 can be used on all general metalworking applications as well as arduous operations such as:

- Broaching
- Creep feed grinding
- Gun drilling
- Hobbing
- Mapal reaming
- Turbine machining
- Tapping
- Neat oil replacement

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AEROSPACE INDUSTRY

Process & Equipment

Makino MC 98 CNC High-Speed Machine

Part:	Turbine Blades
Part Alloy:	Titanium
Speed:	15,000 rpm
Feed:	4 m/min.
Concentration:	8-10%
Pressure:	80 bars (1,120 psi)
Specific Operation:	Milling for rough and finish machine base form and snubber fins

Product & Process Expertise

Metalworking lubricants represent a very minor part of the costs in a metalworking process, typically less than 1%. This case illustrates the importance of correct fluid selection. The impact of the fluid can be a multiple of its costs, making the price of a metalworking fluid insignificant. That is why Quaker focuses on developing fluids with the highest performance without compromise, fluids that sharpen your competitive edge.