

ACHIEVE OUTSTANDING MACHINING PERFORMANCE ON A WIDE RANGE OF MODERN AEROSPACE ALLOYS WITHOUT THE USE OF BIOCIDES

WHITEPAPER: APRIL 2023



As an aerospace engineer, you deliver precise, lightweight parts – in advanced metals – to the tightest tolerances. But you can't compromise on productivity or safety on the machining floor.

Cutting fluids perform an essential role in the manufacturing of many types of metal components. **One of the main drawbacks of traditional technology is that, over time, the fluid can suffer from bacterial growth and contamination.** This leads to pH depletion, unpleasant odors, unstable emulsion and poor performance.

Since bacteria are found nearly everywhere in a typical machine shop the opportunity for bacteria growth in the fluid is significant. Once bacteria inoculate a metalworking fluid, their growth rate is rapid. Spoilage due to bacteria is one of the most prevalent causes of shortened life and frequent change-outs of metalworking fluids and can have a significant impact on the shop's bottom line.

IT'S MORE THAN JUST OIL. IT'S LIQUID ENGINEERING.®





An alternative to fluid change-out is to treat the system with a tank side biocide. The biocides approved for metalworking fluids are often extremely expensive and may subject operators and plant personnel to potentially harmful chemicals. While this approach may increase fluid longevity, it is often a short-term solution.

Ever-changing environmental constraints and safety regulations are making it harder than ever to deal with bacterial and fungal growth in cutting fluids. Manufacturers increasingly need an alternative to cutting fluids with boron, biocides and formaldehyde-releasing agents (FRAs) – without sacrificing part quality or system life.

Cutting fluids with Castrol® XBB technology are firm favorites for machining operations worldwide

Fluids formulated without FRAs, boron and biocides are available and can help extend fluid life and improve working conditions. Castrol® is one lubricant producer that offers a range of such metalworking fluids.

Castrol® XBB cutting fluids can reduce biocide additive top-ups by up to 90%¹, giving longer life, dramatically reducing operating costs² – without sacrificing performance³.

“Cutting fluids with Castrol® XBB technology are firm favorites for machining operations worldwide, where they help our customers meet stringent HSE legislation and reduce operating costs by eliminating the need for frequent and expensive additive top-ups,” said Dr Rudolf Janner, Global Product Manager at Castrol®. “Hysol® SL 45 XBB now brings the same benefits to demanding aerospace machining applications, so plant managers no longer have to choose between quality, safety and productivity.”

Castrol® Hysol® SL 45 XBB gives outstanding machining performance across a wide range of aerospace alloy-cutting processes⁴ and is approved by Tier 1 aerospace OEMs⁵. Its excellent lubrication results in longer tool life and higher surface finish, while excellent wetting properties help keep machines and parts free from swarf build-up.

CUSTOMER'S TRIALS USING CASTROL® HYSOL® SL 45 XBB REPORT A RANGE OF ADDITIONAL BENEFITS, INCLUDING:

- Cost savings from reduced biocide and fungicide additive top-ups
- Visibly reduced foaming

This soluble cutting fluid is designed for grinding, milling, turning, drilling, reaming, tapping and broaching a range of aluminum and titanium alloys, and is suitable for machining ferrous alloys.

Castrol® XBB technology redefines the core properties of cutting fluids – they're resistant to acid attack from bacteria, proven to maintain pH at a constant level and are therefore inherently more resistant to bacterial growth. Castrol® Hysol® SL 45 XBB is created specifically for the aerospace industry, approved by major manufacturers, and supports the health and safety of aerospace machining environments in line with current and potential future legislation.

For further information, contact your Castrol® representative at **888-CASTROL** or visit our website, **www.castrol.com/xbb-us**

1. Source: Customer Case Study, Hysol® SL 45 XBB, extended system life from 3 weeks to 5 weeks (67%) without any biocide additive top-ups.

2. Source: Customer Case Study, Hysol® SL 45 XBB, the proof points of no odours and savings up to USD \$15,000 a year.

3. Source: Based on Alkalinity and 28-days Microbiology Challenge Lab Tests against major competition in 2017

4. Source: Based on Alkalinity and 28-days Microbiology Challenge Lab Tests against major competition in 2017

5. Source: OEM approval letters