Just two years ago, ANGUS Chemical Company introduced CORRGUARD™ EXT Amino Alcohol, a primary amino alcohol that was specifically designed for the metalworking fluids (MWF) market. Since then, we’ve had the opportunity to assess the value of the new technology in real-life scenarios with commercial MWF formulators.

With excellent oil — and sufficient water — solubility, CORRGUARD™ EXT Amino Alcohol has proven to offer great flexibility in a wide range of new MWF formulations, from solubles to semi-synthetics to full synthetics.

**Better Performance through Biocide Enhancement**

One way that CORRGUARD™ EXT Amino Alcohol brings value to both formulators and end-users is its biocide enhancement. CORRGUARD™ EXT Amino Alcohol improves the performance of many biocides, allowing them to maintain control of bacteria and fungi for longer periods. Improved microbial control means that pH stability, corrosion control and overall fluid life are maintained for a longer period.

CORRGUARD™ EXT Amino Alcohol works with a wide range of biocides, as is shown with benzisothiazolinone (ROCIMA™ BT 2S Antimicrobial), a biocide that does not contain or release formaldehyde. Increasingly, formulators are being asked to develop fluids with non-formaldehyde releasing biocides. The addition of CORRGUARD™ EXT Amino Alcohol to such formulations dramatically improves fungal and bacterial control, as shown in Figure 1.

The pH stability of a MWF is a function of many factors, including the microbial resistance of pH buffers and other components. Microbial growth generates acid-functional by-products that reduce fluid pH. Because CORRGUARD™ EXT Amino Alcohol resists biodegradation at the levels present in working dilutions, and also improves the performance of biocides, pH stability is improved.

In addition, through improved microbial control, fluids containing CORRGUARD™ EXT Amino Alcohol offer better corrosion control of ferrous metals. For example, when metalworking fluids containing Monoethanolamine (MEA) or Monoisopropanolamine (MIPA) are reformulated with CORRGUARD™ EXT Amino Alcohol, corrosion is significantly inhibited as shown in Figure 2.

**Capturing the Value in Formulation**

The job of MWF formulators has become more difficult due to stringent end-user and regulatory demands and limited in-house resources. To help formulators evaluate the viability of CORRGUARD™ EXT Amino Alcohol in application, ANGUS offers comprehensive technical application support that includes:

- Challenge testing for microbial control
- Corrosion testing
- Formulation assistance that includes methods to improve emulsion stability

Our specialists not only help formulators optimize the performance of new MWFs, but also work to minimize the cost impact. For example, our testing has shown that metalworking fluids containing high levels of ethanolamines can be easily reformulated with CORRGUARD™ EXT Amino Alcohol to significantly improve fluid life and performance – at a similar cost.
Figure 1. CORRGUARD™ EXT Amino Alcohol: Example of Enhanced Biocide Performance for Improved Bacterial and Fungal Control

Key benefits with using CORRGUARD EXT / ROCIMA BT 2S include*:
- Excellent fungal efficacy
- Improved corrosion control
- Effective pH control

* In addition to exceptional performance with ROCIMA BT 2S, CORRGUARD EXT offers enhanced performance across a wide range of biocides.

Figure 2. CORRGUARD™ EXT Amino Alcohol: Improved Corrosion Inhibition

*Metalworking fluids containing CORRGUARD EXT deliver improved corrosion inhibition

*12-Week Microbially Aged Non-Borated Semi-Synthetic
Implications for Global MWF Sales

By enabling the formulation of longer-life fluids with improved performance, CORRGUARD™ EXT Amino Alcohol brings value to all types of MWFs, from commodity fluids containing high levels of ethanolamines to premium, specialty fluids. For this reason, and others, CORRGUARD™ EXT Amino Alcohol is an excellent choice for MWFs sold globally.

As a primary amino alcohol that is readily biodegradable, CORRGUARD™ EXT Amino Alcohol has a favorable environmental health and safety profile, and it is listed on chemical control inventories or registered for use in countries around the world including the United States, Europe, Canada, Japan, Korea, and China. Extensive testing was completed for this product to support the multiple regulatory approvals it has obtained, including being REACH compliant.

In addition, due to their exceptional corrosion control, MWFs formulated with CORRGUARD™ EXT Amino Alcohol offer end-users the opportunity to use a single fluid across multiple metals, thereby standardizing and simplifying their MWF specifications.

The ANGUS application support team can provide tools and expertise to help formulators develop global MWF formulations with different ingredients to meet regional market specifications.

A quick reference guide for using CORRGUARD™ EXT Amino Alcohol can be found at www.ANGUS.com (under “Metalworking Fluids”). For a sample and/or additional information on CORRGUARD™ EXT, visit the website or call 800-447-4369.

Justin Conklin is a global marketing manager for ANGUS Chemical Company
The innovation behind CORRGUARD EXT Amino Alcohol enables metalworking fluids that are higher performing and longer lasting.

CORRGUARD EXT Amino Alcohol from ANGUS provides formulators with…

- **Exceptional performance** enhancement of biocides, offering high performing alternative systems to formaldehyde-releasing biocides.
- Improved **Corrosion Control** of ferrous metals and improved aluminum alloy corrosion control through reduced amine content allowing use of a single metalworking fluid for multiple metals.
- An **advanced primary amine** technology that is both readily biodegradable and REACH compliant.

Whatever your metalworking fluid challenge, ANGUS can help. Visit [www.ANGUS.com](http://www.ANGUS.com) for more information and to review a recent case study of CORRGUARD EXT Amino Alcohol or call 1-800-447-4369 for more information.