



**Universal Precision Instruments  
Converts to PICOCUT CODE BLUE  
To Improve Tool Life and Finishes  
August 14, 2007**

*Universal Precision Instruments, Inc. has upgraded its machining productivity by converting to **PICOCUT CODE BLUE**, a new generation chlorine free cutting oil that provides significantly improved tool life with very tight tolerances over black sulfur-chlorinated oils and water solubles.*

**COMPANY HISTORY AND CAPABILITIES**

**Universal Precision Instruments, Inc.** of Elkhart, IN is a contract manufacturer that specializes in high precision medical machined devices requiring highly accurate dimensions and superior finishes. The company known as Bates Machine began in 1979 as a general purpose machining operation and by 1990 was converted into producing primarily instruments and surgical implants especially for orthopedic applications. After Keith Bates retired in 2005, the company was purchased by an investment group led by Ron Drown who continued the policies of attention to superb detail, high quality and personalized customer service. He also foresaw that the medical market would continue to grow and require highly intricate material machining for its complex devices. Ron and the leadership at **UPI** laid out strategic plans for sound growth supported with financial backing and the security it offers.

To achieve those plans and commitments **UPI** accomplished its registration for ISO 13485:2003 and 9001:2000 and has provided its customers a “one-stop-shop” with prototyping services, advice for instrument design and full production run capabilities under one roof. **Universal Precision Instruments** utilizes CAD / CAM software that provides a direct link via a wireless network from the engineering office to all CNC machining stations.

Their machining processes start from raw metal and material stocks to highly finished parts utilizing CNC lathes, chucks, mills, EDM, laser etching, grinding, bead blasting, buffing and polishing. Many of the state-of the art machining centers have been added within the last 5 years, allowing **UPI** to offer unparalleled manufacturing capabilities for intricate accurate devices. Materials that are commonly processed are titanium, stainless steels (including the toughest of alloys), Cobalt-Chrome, Delrin, PEEK, UHMW, and aluminum. Highly accurate tolerances of 0.0005 can be achieved with live tooling even on the most complex parts by **UPI**'s highly experienced operators. The results are often admired by customers because of the artistic beauty achieved on such intricate medical devices.

## **PRODUCTIVITY IMPROVEMENTS**

Because **UPI** seeks continuous improvement and tighter repeatability for its parts production, it is always searching for the best practices, tooling and lubrication solutions. At the same time it wants to be as environmentally responsible as possible for not only their customers but their workers, neighbors and community. Like many other shops in the medical component market, **UPI** had used black sulfurized-chlorinated oils, spike additives and heavy duty solubles to maximize tool life and achieve the best finishes. The choice of lubricant-coolant mix often depends on the exact machining process, tooling and materials being cut. Where possible John Zeitler, Manufacturing Manager, favored high powered compounded oils to provide the maximum lubricity and extreme pressure (EP) effectiveness to extend tool life and reach the tightest tolerances with the smoothest finishes.

However, there are some severe limitations with older technology neat oils. These include dirtiness created on the machinery, nasty sulfur odors, misting especially under high machining speeds, heat build up, foam with high fluid delivery rates, cleaning difficulties and environmental issues raised by the disposal of chlorinated paraffins. Water solubles cannot deliver the EP punch and lubrication value especially on titanium and certain grades of stainless that oil can. This lubrication deficiency would result in lower tool life and more finishing steps to achieve bright surfaces. Consequently John was seeking a new technology lubricant that would eliminate the drawbacks of oil, upgrade the overall quality of his production, and save money by reducing tool changes.

## **THE PICOCUT CODE BLUE SOLUTION**

**PICO** Chemical recently developed **PICOCUT CODE BLUE** in response to customers' requests for a chlorine-free oil that could replace older technology products but at the same time surpass their desire for longer tool life, higher production speeds and improved finishes. **PICO** believed that a clear oil with an appealing distinctive color and low misting characteristics would offer machining companies both in the medical and aerospace industries a solution for productivity, satisfied operators and positive financial results. Instead of using the older additives, **PICO** approached the issues by examining both the base oils and incorporating new technology synergistic additive systems without chlorinated paraffins.

According to **PICO**'s chemists, **PICOCUT CODE BLUE** can operate over a wide range of temperatures because its EP and lubrication system "kick-in" during the entire gamut of metal removal applications (from milling to threading), thus giving the oil outstanding performance from the initial cut to the final CNC operation in a variety of machining operations time after time. As these additive systems operate, they reduce the heat generated by the metal deformation at the point of cut, thus raising the oil's efficacy, cooling capacity, resistance to break-down, and tool wear.

As long as the oil is filtered to remove the chips and fines, **PICOCUT CODE BLUE**'s bath life is virtually unlimited because it is formulated to be protected from oxidation and not experience selective additive depletion as do older oils and fluids. **PICOCUT CODE BLUE** does not develop "Monday Morning" odors, needs no concentration checks, mixing or fluid management services.

### **PRECISION'S ADVANCEMENTS**

According to John and other **UPI** operational personnel the results have been rather remarkable. After a year's use, **PICOCUT CODE BLUE** has replaced all older cutting oils and has exceeded their expectations by significantly increasing (doubling in some cases) tool life cutting tough stainless alloys and titanium without needing any "spike" additives. According to Chris Kusnierek, **UPI**'s Quality Manager, **PICOCUT CODE BLUE** has allowed **UPI** to achieve even higher tolerances in a repeatable fashion and in some cases reduce the need for further finishing steps such as polishing and buffing.

Machine operators report that they truly appreciate **PICOCUT CODE BLUE**'s clarity for machine and part cleanliness. Its mild odor and pleasant blue color improve the work environment from the old black smelly sulfurized oils. Because it is chlorine free, **PICOCUT CODE BLUE** does not have undesirable cleaning, staining and environmental issues often found in the older formulated "red" oils that were popular in the stainless machining industry.

John Zeitler was also able to replace some water solubles being used at excessive concentrations with their high additive packages where machining performance (tool life and finishes) were marginal. As John states: "Using **PICOCUT CODE BLUE** wherever I can has saved us time and money by reduced tool usage and lowering maintenance expenses of downtime for tooling changes, concentration control, biological concerns, disposal costs, rusting issues and excessive foam generation." In fact, on one of **UPI**'s high pressure (2,000 psi) coolant feed systems "all of us were pleasantly surprised to see how low the foam was with **PICOCUT CODE BLUE**." **UPI** customers will often remark how bright the machined surfaces are that come directly from the CNCs.

John believes that job shops in the medical, aerospace or high precision machining business will also call for "**CODE BLUE**" when they need to upgrade their lubrication requirements without introducing any negative environmental issues caused by chlorinated paraffins.

### **CONCLUSION**

Older technology formulated cutting fluids for stainless steel, titanium and highly alloyed steels often required large quantities of chlorinated paraffins for their EP properties or high soluble oil concentrations to achieve adequate lubrication. Chlorinated paraffins have serious drawbacks for environmental, cleaning and corrosion issues. **PICOCUT CODE BLUE**, a new technology chlorine free oil, has proven its value through improved tool life, better finishes and overall lower operating costs. Its effectiveness is maximized

in difficult and demanding applications such as those found in the medical device and aerospace industries. For those cutting oil applications that require an oil used as a dual purpose machine oil without staining copper or brass alloys, **PICO** offers a modified version called **PICOCUT CODE BLUE 2**.

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Electronic photographs taken at Universal Precision Instruments are available for use in publications and sales or advertising demonstrations. This copy has been reviewed by **Universal Precision Instruments, Inc.** and has been certified to be essentially correct and accurate. Questions may be directed to John Zeitler, Manufacturing Manager **Universal Precision Instruments, Inc.** (574) 264-3997 or email [Engineering@universalprecisioninstruments.com](mailto:Engineering@universalprecisioninstruments.com).

Electronic photographs of **PICOCUT CODE BLUE** showing its color and clarity are also available.

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**PICO Chemical Corporation** is an ISO 9001:2000 certified manufacturer of value-enhanced specialty chemicals and lubricants to clean, condition, lubricate and protect metalworking, metal finishing operations and their related processes since 1976. 8/14/07