

## **T N S Machining Productivity Improvement**

### **PICO Coolant Success Story**

**September 15, 2004**

*After 20 years, T N S Machining, Inc. has found a universal shop-wide coolant that has solved many common operational problems. PICOCOOL 5254, a new generation high technology synthetic coolant, provides excellent lubricity for a variety of machining operations on many different materials especially difficult aluminum alloys.*

#### **COMPANY HISTORY AND CAPABILITIES**

T N S Machining in Muskego, Wisconsin is both a prototype and production machining job shop. After working in the machining industry for many years, Thomas Rowinski, Jr. and his sons started their business in 1981 because they believed they could do a better job of providing customers with highly specialized machined precision parts. Their business has since flourished because of its excellent reputation and quality work performed for a variety of industries. Sales growth has continued primarily through customer referrals, testimonials and word of mouth. Their client base is widespread with parts being shipped throughout North America. T N S Machining services many industries including: medical, food, bottling, beverage, hydraulic, electromagnetic, automotive, recreational equipment and tooling.

T N S Machining handles challenging jobs from a few prototypes to multi-million parts production runs. The company utilizes CNC machining centers, lathes, grinders, chucks and screw machines and also performs a variety of secondary operations including cross drilling, tapping (cutting and forming) and deburring. T N S Machining uses a variety of tooling and machines a full spectrum of metals and materials including carbon steel of various grades, stainless, aluminum, copper, brass and plastics. On a typical day, milling, drilling, tapping, reaming and grinding are running simultaneously.

#### **COOLANT PROBLEMS**

Because of the variety of metals, machining applications and precision quality, T N S has been searching for one coolant that can be used in all machines that require the use of water soluble fluids. Over the years they have tried soluble oils, semi-synthetics and synthetics from both major manufacturers and smaller regional suppliers. Until recently, all the coolants had some significant deficiencies. T N S has experienced all coolant problems prevalent in the machining industry including "Monday Morning Stink," troublesome residues both tacky and oily, rusty parts, dermatitis, tramp oil contamination, fuzzy refractometer readings, inadequate lubrication, short sump life, excessive foaming, coolants turning grey just before they go belly-up and excessive bacterial growth. T N S has tried many of the "band-aid" remedies such as tank side additives of liquids or tablets and special filtration devices. The problems often were uncontrollable as machining jobs changed and CNC sumps remained shut down for several days allowing biologicals to grow. For example, grinding swarf became a bio-breeding ground and over time tore apart all three previously used coolant types. In addition, Muskego's water quality can vary seasonally from moderate to very hard. As with all coolant systems, evaporation from sumps and systems exasperated the coolant problems by concentrating the water's contamination.

While coolant control issues were troublesome, machining problems caused by a coolant's variation appeared at T N S and at times became unacceptable. For example, lubrication in an aluminum threading operation would degrade over time, and the threads were pulled out by the

tool. In other operations, surface finish would become unacceptable and tooling life decreased. Often the only solution was to change out both the coolant and tooling causing a serious loss of productivity. T N S Machining' 20-year desire to find one "universal" and consistent coolant seemed unreachable.

### **THE PICO COOLANT SOLUTION**

Scott Rowinski, Vice President, presented this coolant challenge to **PICO** Chemical Corporation of Chicago Heights, IL. After surveying T N S's facility, PICO's sales representative and technical personnel felt that PICOCOOL 5254, a new generation high technology synthetic coolant, could function well in all the various operations and maintain its performance with the local water conditions. After a thorough chemical and mechanical cleaning, PICO's oil free coolant would keep the sumps and delivery systems free of bacterial problems. PICOCOOL 5254 was also chosen to handle the aluminum and stainless work because of its high lubricity without excessive foam in the CNC and centerless grinding spray delivery systems.

From the first day and after many months, according to Scott PICOCOOL 5254 has met every objective and is now the one "universal and versatile" shop wide coolant for all their water soluble systems. In Scott's own words, "The best terms to describe PICOCOOL 5254 are its consistency and trouble-free operation." All coolant systems are kept in a 6-8% range concentration and are routinely checked with a refractometer. No other controls or additives are needed.

### **T N S PRODUCTION IMPROVEMENT EXAMPLES**

In steel grinding applications ranging from 0.5 to 20 thousands stock removal, PICOCOOL 5254 improved ground surface finishes. Bacterial growth does not occur from cast iron or steel swarf accumulated in the bottom of sump tanks.

With PICOCOOL 5254 thread quality improved in cut and form tapping 1018 and 4140 steel. PICOCOOL 5254 provided superior lubrication on small diameter 6061 aluminum tap holes. After continual production runs, aluminum metric thread specifications are maintained without tap changes. Previously used coolants could not penetrate as well into the blind end holes and inadequate lubrication galling occurred.

Precision machining both 7075 and 6061 cast and wrought aluminum alloys has become routine and finishes are smoother. Production runs have been extended between tool changes, and in some cases the improvement has been over 100%.

PICOCOOL 5254's clear solution allows workers to inspect work and tooling while at the same time leaving machinery and parts clean (i.e., no oily or sticky residues). All tramp oils quickly split out from the coolant and are easily skimmed off sumps. During severe machining, there is no oil smoke or heat generated vapor mists coming from this synthetic coolant. Using standard hygiene practices, workers can handle parts without experiencing skin problems. Without rancidity problems and their associated oil split outs, PICOCOOL 5254's longer sump life produces fewer clean outs, less product consumption and reduced waste disposal costs. No chemical additives, oxygenated gases or auxiliary equipment treatments are needed to keep solutions of PICOCOOL 5254 fresh and clean.

### **CONCLUSION**

T N S Machining has found a single coolant, PICOCOOL 5254 that does not have any of the previously experienced problems of other coolants and has improved the company's productivity while reducing its operating costs. Using PICOCOOL 5254 across the board has reduced potential coolant mix-ups and different maintenance procedures. T N S machine operators like the coolant's clear solution, pleasant odor, ease of mixing and simplified maintenance. The fact that PICOCOOL 5254 contains no mineral oil or chlorinated paraffin means that waste treatment, oily residues and bacterial growth have been significantly minimized. The trend to use oil free lubricants is once again increasing because of rising international costs and supply uncertainties.

---

Photographs taken at T N S Machining are enclosed for use in publications and sales or advertising demonstrations. This copy has been reviewed by T N S Machining Inc. and has been certified to be essentially correct and accurate. Questions may be directed to Mr. Scott Rowinski, Vice President T N S Machining, Inc. (414) 679-1993.

Written and submitted by:

Mr. Joe Manfreda  
Marketing Services Manager

**PICO Chemical Corporation** has been in business since 1976 and is an ISO 9001:2000 registered manufacturer of value-enhanced specialty chemicals and lubricants to clean, condition, lubricate and protect metalworking, metal finishing and related processes.