

Your

Spring, 2003

News for Creative Evolution CNC owners

CNC Evolution

Now 8 Days A Week!

All machines with the Creative Evolution CNC can now go a lot faster! One of the key features of the Creative Evolution CNC is our software update-ability. This month's release of version 2.0 heralds a dramatic improvement in cycle times and accuracy. Normal cycle times for dense 3-D data can improve by about 12 to 20% or more, depending upon the complexity of the contour. Our standard performance test run on our model HS-500 has historically taken 6 minutes 10 seconds. Version 2.0 reduces that cycle time to 4 minutes 40 seconds. Additional benefits include sharper corners, better finishes, and longer cutter life. The update can pay for itself in just 5 weeks at common hourly rates today.

If your Creative Evolution CNC machine or control is out of warranty, you can update to version 2.0 for the annual software maintenance charge of \$1995 per machine. Multiple machine/control owners get a 10% discount to \$1,800 per machine. A service call is required for installation to verify tuning to our latest standards for optimal performance and accuracy. A 10% discount applies to all service calls when ordered with annual maintenance.

If your Creative Evolution CNC machine or control is less than 1 year old, you qualify for update to version 2.0 at no charge.

If you are running software earlier than version 1.33, you gain the additional benefit of on-screen diagnostics for the I/O system. Inputs and outputs can be simultaneously displayed in real time during operation, for faster troubleshooting. This

feature can take reliability a step further for still greater up-time.

Software updates include a copy of our latest manual and on-screen help file, giving your operator the programming tips he needs at his fingertips. Annual support further gives your company full telephone support on your Creative Evolution CNC to help keep your operators at the peak of their profession.

Call for more information or to schedule your installation.

Version 2.0 of the Creative Evolution CNC fulfills another of the design mandates, update-ability. A 10% to 25% improvement in cycle times by software update can effectively *add an extra day to every week!* Surprisingly, the improvement is greater for more complex parts. And, sharp corners are now even sharper.

June, 2003

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Machine Sales



WE WANT YOUR MACHINE!

Our recent newsletters have shown several pre-owned machines for sale. Owners had the opportunity to upgrade to newer machines and new buyers filled in capabilities they needed at reduced costs. We want your listing! If you have a machine with the Creative Evolution CNC control for sale, or if you are considering an additional CNC mill, we can help.



New Machines For Sale

Part of the evolution of our own company and our clientele has been the need for more and faster equipment, some of it for very special applications. We offer a wide range of high speed 3, 4 and 5 axis machines. Spindles range to 60,000 rpm, and there is no limit to the options and accessories available. Please refer to this month's special insert, or call with your specifications.

Political Action

How do you feel the tool and mold industry's health is today? Many of us feel threatened by the volume of work being sent offshore. "Whining won't do any good" said Craig Fitzgerald of Plante & Moran when speaking in March for the AMBA (American Mold Builders Assn.) convention in Florida. "They [the U.S. government] aren't likely to change policy because they don't see the need."

Many of us disagree. While it is true that complaints are not likely to make any rapid changes, a united voice can help influence changes to make our government more aware of the plight of American manufacturers in general. Today, our government has no manufacturing policy at all! Back when there was a military draft, there were deferments for defense-critical jobs like all tooling. Now they don't seem to care whether or not we have the domestic capability to make anything. Even custom military defense products are being manufactured offshore! What has changed that eliminates our need for manufacturing including defense?

Now is the time to make yourself heard. We don't expect protectionism, but we also don't want to be promoting the mass exodus of our own jobs and manufacturing capabilities. Allowing that to continue will only accelerate our loss of jobs, reducing our own ability to buy goods, further reducing the standard of living and consumerism. The result will likely be a loss of world leadership and the rights and privileges we all enjoy today.

Our current war emphasizes the need for independence, even in our modern times of global economy. Taking action is easy today. Through the Internet, you can easily find the names and contact information for your own government representatives on any level from local officials right up to the president of the United States. Additionally, trade associations like the AMBA (American Mold Builders Assn), TMA (Tooling and Mfg. Assn), and SAM (Save American Manufacturing) are all working to implement FAIR TRADE regulations, not just "free trade." If you belong, help strengthen their message by taking an active part. If you aren't a member, join and work to make yourself heard.

Change won't come overnight, but can come gradually. At the same time, we have to streamline our own manufacturing capability to improve our own ability to compete.

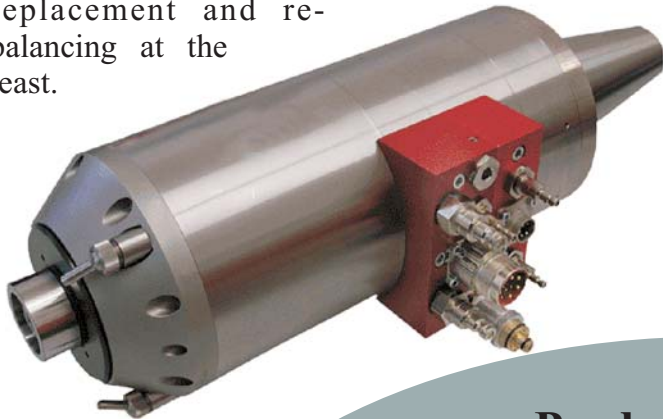
Creative Evolution actively supports the efforts of the AMBA and SAM. We also support our customers' productivity gains for competitive advantage, by offering high performance machining solutions and support at reasonable prices.

Fast Spindles For High Speed

The high speed spindle is often referred to as the heart of high speed machining. The idea is that if we take fast and light cuts, we will benefit from faster material removal, longer cutter life, lower cutting forces, and less distortion of the part being machined.

At first glance, one challenge to high speed machining's success can be the shorter spindle life. The reality is that the spindles hold up equally well with standard spindles when considering revolutions turned. We just turn them so fast and so many hours a week that we use up their useful life faster.

High speed spindles are generally warranted by their manufacturers to last 2,000 hours. In reality, they can normally be expected to last about 5,000 hours or so before requiring overhaul of the bearings, unless they are abused or crashed. An overhaul includes cleaning, bearing replacement and re-balancing at the least.



An overhaul can be expected to cost a bout 25% to 50% of the cost of a new spindle module.

Some companies struggle with the higher speed and lower power when roughing. High speed spindles are not made to “rough” at all. Rather, they cut differently, using fast and light cuts. This technique is required so that the motor is in its best power range and so that the bearings are operating in their normal condition that actually increases bearing preload. At too low rpm, there isn't enough power to rough and the bearings become loose, allowing vibration and chatter. This chatter can damage both the cutters and the spindle. Smaller cutters and higher speeds bring out the best performance in high speed spindles.

Spindle speed can be a challenge for machines that are retrofit with high speed controls. One simple solution can be in-line spindle modules such as IMT's model SKA-02.8/24 shown to the left. These spindles can be inserted in the machine's standard taper and can even interchange amongst multiple machines. Various models are available from several companies, featuring speeds to 60,000 RPM or holders up to 5/8" diameter capacity.

High speed spindles are essential to get the best performance from your high speed machining centers. The new techniques needed to capitalize on high spindle speeds will become second nature as you grow in high speed machining.

Productivity Tips

The following advice can keep your machine more productive

- Maintain your conterbalance; if it is gas charged, make sure it is fully charged. If it's a dead weight, check that the chain is lubricated and the sprockets turn freely.
- Backup your software. Otherwise, a hard drive failure can be costly.
- If your machine has a chilled spindle, clean your chiller filter and and replace the chiller fluid regularly.

Let us
hear
from
you!
Tell us
how we
can improve
or tell us your
success stories. We

are committed to offering the highest performance and reliability in complex 3, 4, and 5 axis CNC milling for reasonable prices. Email us at info@creat.com.



Back To Basics

Mark Mills, hard milling expert and founder/president of Cherub Technologies, Inc., Elkhart, Indiana, says that going back to the basic concepts for learning can swing open the doors to success for profitable hard machining techniques! Here's how.

READING

Read the books. Those catalogs they give you when selling cutters don't just list the sizes and show pictures! They generally have a wealth of information describing the guidelines for optimal cutter performance. There are also catalogs, technical bulletins, and performance calculators posted on many Internet web sites. The information provided may not be exact for your situation, but provides a sound starting point.

'RITHMATIC

Do the math. The numbers listed in the charts are often not the simple answer. As a rule, the spindle RPM is NOT listed. Rather, they list the surface speed in surface feet-per-minute. From there, it's easy to calculate the rpm using Mark's shortcut: multiply the surface speed by 3.82 (magic number 1) and then divide that by the cutter diameter. The next thing to figure is the feedrate. Simply multiply the spindle speed by the number of flutes on the cutter, and multiply that by the chipload per tooth that's recommended.

'RITE IT DOWN!

Now that you are ready to cutterpath and cut, you will see some results. They seem so vivid at the moment that you are sure you will never forget, but the work flows and other important things come up. You will forget. **'Rite it down!** The most important step of all is the learning process that takes place when you see the results and learn what worked for you in this specific situation. Mark Mills can show books of notes he has

kept on cutting scenarios and results achieved with specific brands of cutters, carbide and coating grades, and steel alloys in differing states of hardness.

Your notes and history of actual experience will prove to be your competitive advantage in this fast-paced world of high-speed machining.

High Speed machining of hard materials is not as simple as some would promote. It is also not as difficult as it might seem. Just like in school, disciplining yourself will pay big dividends in your own success.

MARK'S MAGIC FORMULAE

MAGIC FORMULA #1:

$$RPM = sfm * 3.82 / dia$$

When you see surface speed given for a cutter, multiply it by 3.82 and divide by the cutter diameter. The result will be the spindle speed you need.

MAGIC FORMULA #2:

$$Feed\ rate = RPM * chip\ load * teeth$$

To calculate the proper feedrate based on a specified chip load per tooth, multiply the spindle speed (calculated in formula 1) by the chip load per tooth (from the cutter chart) times the number of flutes or cutting edges on your cutter.

MAGIC FORMULA #3:

$$sfm = .262 * cutter\ diameter * RPM$$

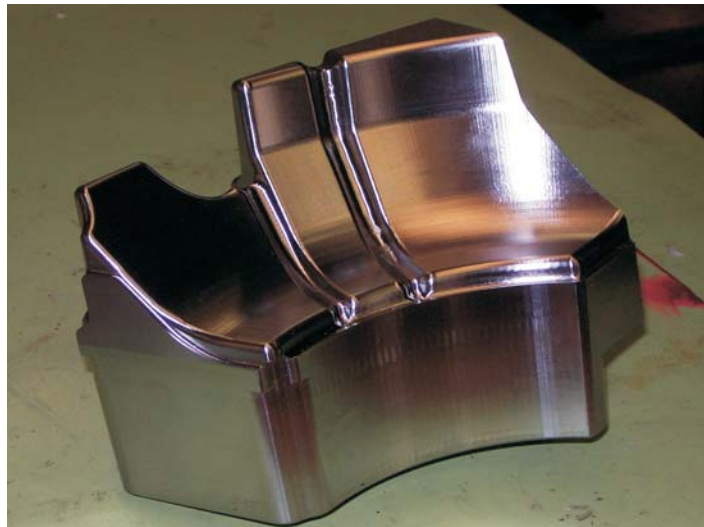
If you want to calculate the surface feet per minute of your current cutting conditions, multiply .262 by the cutter diameter and multiply that by the spindle RPM.

MAGIC FORMULA #4:

$$Chip = (feed\ rate / RPM) / teeth$$

To calculate the chip load for your current settings, divide your feed rate by the spindle speed and divide that by the number of flutes or cutting edges.

*Remember the old key to learning,
'Reading, 'Riting, 'Rithmetic?'*
*Those same three R's can be your
key to high speed success!*



High speed milling of mold inserts from hardened H-13 tool steel is common at Cherub Technologies