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January 2007 volume 3 issue 1

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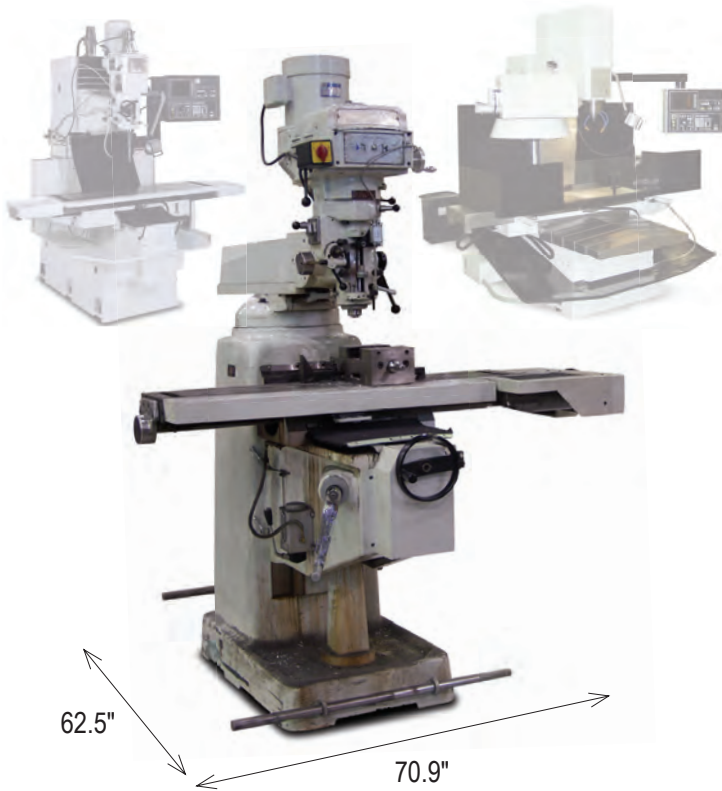
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## Today's Machining World

JANUARY'S TALENT POOL.



**Rachel Cook** received her BFA in Illustration from the Milwaukee Institute of Art and Design in 2004, and has been professionally illustrating ever since. Although her animated children's work has kept her busy with private commissions, she recently made her mainstream editorial illustration debut in *TMW*'s July issue. When she is not promoting herself or working on a project, she enjoys hanging out with her husband and watching horror movies. More of Rachel's work can be seen and enjoyed at [www.portfolios.com/rachelcook](http://www.portfolios.com/rachelcook).



**Barbara Donohue** received her mechanical engineering degree from MIT. She worked in design, heat transfer and manufacturing for several years before changing careers to become a journalist. Now she writes about technology and business from her home office in Acton, Massachusetts. When not writing, she sings in a choir, volunteers as a literacy tutor, and is weekend "foster mom" to a yellow Lab puppy named Tikva that is training to become a wheelchair assistance dog.



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**Russell Ethridge** is a lawyer and the part-time judge of the suburban Detroit community where he lives with his physician wife and three children. During stints as an auto worker, butcher, reporter, and law clerk, he managed to get law licenses in three states, which have been used mostly in civil and criminal courtrooms east of the Mississippi and in the boardrooms and work floors of auto companies and their suppliers, hospitals, and other institutions. He holds no particular qualifications to write his column except that he was a Boy Scout for a while.




**Robert Strauss** was formerly a reporter for *Sports Illustrated* and the *Philadelphia Daily News*, and a news producer at KYW-TV in Philadelphia. Now a freelance writer based in Haddonfield, NJ, where he revels in his two daughters' basketball prowess and their eye-rolling at his bad puns, his work appears most often in the *New York Times*, the *Washington Post*, the *Los Angeles Times* and *Today's Machining World*.



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## editor's note

### The Price of Anything

One of my abiding lifetime fascinations has been understanding how markets value things. My father raised me on stories about buying machines at low prices and selling them at higher ones. I've been titillated by the stock market since childhood as I've tried to grasp the mystery of the shifting values of equities.

Recently our new accountants leaned on us to do a comprehensive inventory of our stuff so they would feel secure about the values ascribed to our inventory in case the IRS came to visit. So we counted every screw and shaft (well, give or take a few) and dutifully recorded the tally. The accumulation of a business lifetime of buying and selling, stripping and saving. And what is it worth?

A useful fictional number will be affixed to the iron because the taxman demands it. But what is it really worth? Nobody knows because it changes every day, just like the stock market and the price of celery.

In this magazine we have the audacity to explore the ideas – and the prevailing fictions that affect our personal and professional lives.

The fear that a tiny amount of lead in a steel fitting in a junked car could be injurious to a wandering French lad is an idea (a fiction) that affects the business life of a toolmaker in San Diego or a machinist in San Juan. It changes the price of metal you buy and the components you sell.

The price of anything is a market-driven construct, shaped by the ideas of an instant. And the fictions.

Lloyd Graff  
Editor/Owner

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### Radical Proposal

Lloyd, I like your proposal for machine tool builders to fund an advertising program to attract young people to our industry (Afterthought, October 2006). Our industry seems to prefer to recruit or steal employees from related businesses or competitors. No one wants to hire entry level personnel and train people. Everyone wants to hire qualified or experienced employees. Somebody has to give young people their first chance. We have built a business with many entry-level inexperienced people who were willing to be trained and learn on the job. Many of these people have been with us for years and play key roles in our business. An effective advertising program would draw more candidates, but companies will still have to be willing to train people.

Great magazine – great article.

Robert Arthur  
Arthur Machinery  
Tampa, FL

### Round Two

Jim Rowe from Mahar Tool Supply had a Shop Doc answer that I totally agree with (October 2006). When I was Operations Manager at a large cutting tool company, 90 degree spotting drills outsold 120 degree spotting drills by a 2 to 1 margin. I never understood why someone would go through the motion of using a spotting drill, then be more concerned with getting a “free” chamfer than using the correct tool for accuracy.

Doug Pav  
AMS  
Clinton Twp. MI.

### Dream It – Do It

Your Afterthought in the October issue is right on. I wanted to make you aware of a program that is paralleling exactly what you are suggesting in your article. Last year, the National Association of Manufacturers ([www.nam.org](http://www.nam.org)) piloted a program in Kansas City called “Dream It Do It.” After a successful pilot program, they had the first state roll out in Nebraska in September 2006. The Nebraska Advanced Manufacturing Coalition (NAMC) is spearheading the “Dream It Do It” program in Nebraska. The goal of “Dream It Do It” is to bring awareness of advanced manufacturing to students, parents, teachers, guidance counselors and the general public, particularly targeting 16-24 year olds. Mass advertising – what most manufacturers consider non-traditional means like radio, TV, billboards, podcasts, etc. – is a primary tool in getting the word out about advanced manufacturing.

I would love to see some of your ideas considered. I think your ideas for “getting the word out” and your thoughts for raising money are very good. As an advisor to the NAMC, I would like to get you in contact with the national and state leaders of “Dream It Do It,” if you are interested. I am going to pass your article on to them.

P.S. In my opinion, your magazine is by far the best monthly trade publication out there. I was made aware of it earlier this year, and is now the only trade publication in my “must read” pile of magazines. Keep up the good work.

Scott Volk  
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# The Auto Land Update

**T**he stock price of bankrupt Delphi Corporation has bubbled up to \$3 per share as the vulture hedge funds scarf up the shares. Meanwhile Ford stock meanders around \$7.50 and Warren Buffett invests in General Motors and Kirk Kerkorian bails out with a break even on his billion dollar bet on GM to throw money into the slot machine business.

It seems like every month sees a big new bankruptcy in automotive land. The recent Dura filing will not be the last. The hard question is whether the restructuring of the automotive business here is nearing a climax, or are we still in the turbulent middle of the shakeout process.

Some smart money is betting that GM has weathered the storm and is poised to even begin to gain market share in light

trucks and crossovers. This belief has solidified Rick Wagoner's position with the Board of Directors and emboldened him to diss Carlos Ghosn of Renault-Nissan and stare down Captain Kirk and Lieutenant York. The larger than expected employee buyouts at Delphi and GM mean that he can hold the GM-Delphi nexus together.

On the other side of town, Ford looks like a basket case. They are burning cash at an alarming rate. The light truck business is losing share to a restyled GM and an aggressive Toyota. The car business for Ford in North America is nauseating. They've brought in Alan Mullally from Boeing, who was confident enough to tell the press he drove a Lexus because it was the best car available. Enjoy the Tigers, Alan.

GM had their finance business, which they sold a piece of to raise cash. Ford does not have that move to make. Even with Bill Ford on the sidelines now, the company looks weaker than even the Detroit Lions, which Bill's dad mismanages.

Amidst chaos there is always opportunity. GM stock bounced from \$18 to \$35 in 2006, and if you were gutsy enough to buy when you could see the whites of Wagoner's eyes, you could have picked up Delphi stock for 59 cents on the pink sheets in 2005 when the stock looked like wallpaper.

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**Miyano** BND-42S5, 1998, Live Tools, Sub-Spindle, IEMCA Loader



**Mori Seiki** DL-151Y, 1998, Y-Axis, Twin Turret/Spindle



**Tsugami** BS-32CII, 2000, 1 1/4", 8 Rotary Tools, Sub-Spindle, IEMCA



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As I write this piece, Autocam of Grand Rapids, Mich., totters on the brink of bankruptcy – another automotive supplier flailing in the wind shear of the American auto parts market.

Autocam is considered a Tier Two supplier; but with 2600 employees in the U.S., France and Poland, it is no longer the shop in Western Michigan I used to know.

The company grew like mad in the 90s, went public, expanded abroad, went private and is now owned 40 percent by Penske Corporation, 40 percent by Goldman Sachs, and 20 percent by John C. Kennedy. Unfortunately, it's starting to look more like it's mostly owned by the creditors.

With all of the carnage in the auto supplier world it looks like an absolutely terrible business to be in. But a few years ago people were saying exactly the same thing about making steel and mining nickel.

There will be a better day for the auto suppliers. Unfortunately, a lot of the workers who devoted their lives to the business will never see it. Even now, the opportunities are out there for the companies that can navigate the wreckage. For the small and mid-size firms, which have always lived off of automotive, this is a moment of truth. Do you walk through the field of live artillery shells picking up the valuable brass casings along the way, or do you hop on the first flight available for Boca or Scottsdale? Is Detroit totally unfixably broken, or is it one Mustang away from a comeback?

Personally, I think the current chaos will pass. I would not buy real estate in Gross Pointe, but I would stick my trailer in Ann Arbor and wait it out. Cycles are predictable. It is their length and severity which always befuddle us.

We live in what has been described as the "me generation." Forget the community, the nation, the team. It's all about "me." We may not like the self-centered point of view, but from a business standpoint we can try to make it work for us.

In manufacturing, the off-shoring model makes economic sense when the product is mass produced. But what if each product is unique to the individual buyer and the buyer demands it daily or erratically?

Think of a newspaper. The idea of printing a daily paper in China is absurd, because timeliness is essential to the product. Conceivably a coupon supplement could be printed in Shanghai, but changing the prices to the customers would be out of the question.

The Internet takes the newspaper model further. Web portals such as Yahoo! are experimenting with individualized home pages, which provide a frequent user with a front page which caters to the personal tastes of the viewer.

# swarf

Customized manufacturing in many different forms is likely to revolutionize the way we look at products and manufacturing.

In the medical realm this trend is already picking up speed. The standard sizes of joint replacements are being replaced by customized products, which are sometimes being made right at the hospital when the surgery is in progress.

Making a product at the site of need when it is needed is the ideal which is being pursued by Larry Rhoades of Ex One, who we interviewed in December's issue, but he is far from alone in chasing this model. You will read in next month's *Today's Machining World* about customizing the mass production process in a variety of ways.

I came out of an era when the goal was to hook on to a million-piece order which would repeat for years. In the custom world of today and tomorrow, the money will flow to the clever people who adapt to the order of "one."

I think the example of shoes may be the standard we will be looking at. Every foot is different, but Nike wants to sell us mass-produced sneakers with swooshes. We may still buy the swoosh for \$20 extra per pair, but we want the shoes with customized orthotic inserts which make wearing them a pleasure. Enter customized manufacturing at a store near you.

If I can buy my orthotic at a Dick's Sporting Goods store, manufactured just for me in a half hour, I'll beat a path to the store. With a 3-D scanner and a smart piece of machinery this product is within reach, whether it is "printed," molded, or machined. I don't care about the process as a customer, I just want the orthotic fitted to my shoe while I check out the tennis racquets. The Chinese sweatshop may sew the swoosh, but they won't make orthotics in thirty minutes at Dick's.

The task for manufacturers and job shops is to begin aligning your business to this need, which so far has barely been defined. This is a case where being an early adapter may be extremely profitable.





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This kind of customization of product is going to be played out in millions of variations in the next decade. The firms which ally themselves with the custom product on the generic platform will be the winners. This will be the "long tail" in manufacturing.

**Lately**, I've been in a losing period. I can't find things like keys, glasses, passport, TV remote, pens. I'm always disorganized from dawn to dusk, but currently I am more discombobulated than usual.

I know this state well. It is an old companion. My former guru Dan Sullivan used to call it "reaching the ceiling of complexity."

At the quarterly seminars I took with Dan he would admonish us to clean up the messes in our lives and get rid of the stuff – the clutter, that screws up our focus and crowds out the time for real recreation.

Dan strongly recommended that we segment our lives by allotting whole days to cleanups (attending to messes), focusing (doing only those things that are in our sweet spot and make us money), and leisure (when we rest and regenerate). The clarity of demarcation of time is the key. He believes that you can't bounce from cleanup to focus to recreation by waving a magic wand. You need to plan these days to get in the proper mindset.

I have always admired Sullivan's clarity about this topic, even if I believed it was a naïve and distant goal for me.

But it is in periods like now when my skull is well bruised from bumping into my "ceiling of complexity" that I long for the clarity that comes with designated days to clean up my messes.

**Bill Parcells**, coach of the Dallas Cowboys, has shocked me this year with his brilliant personnel moves.

Early in the regular season he pulled the incumbent quarterback, veteran Drew Bledsoe, for Tony Romo, an unknown from Eastern Illinois, who had never taken a regular season snap in the NFL. Romo has become a sensation – showing mobility, accuracy and decision-making nobody expected. I was shocked by the Romo choice because Bledsoe had been Parcells' man in New England and he had paid a lot to bring him to Dallas.

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# swarf

In the off-season Dallas picked up Terrell Owens, a narcissistic show-off and serial team disrupter from Philadelphia. Owens is a dynamic wide receiver who "makes plays." This is NFL-speak for the ability to change the course of a game with one spectacular gridiron accomplishment. Putting Owens on disciplinarian Parcells' team was mixing oil and water. He has been a pain, but he has produced and given Romo the big mobile target he needed.

During the off-season Dallas signed Mike Vanderjagt, an extremely accurate kicker from Indianapolis who had blown a key kick in last year's playoffs. He signed a \$5.5 million dollar contract with \$2 million guaranteed, unusually generous for a place kicker in the NFL. Vanderjagt failed to hit the pressure field goals during the first half of the season and Parcells cut him without having a designated replacement. He signed Martin Gramatica, formerly of Tampa Bay, who had been out of football for a year and a half. Gramatica hit a game winner in his first outing.

I have been stunned by Parcells' guts and creativity this year. This is a coach who is going for broke with a mediocre team. By showing a willingness to change course in mid-season, take chances on a wacko but talented player like Terrell Owens, trade in an expensive marquee kicker for Gramatica, a retread, he has emphatically demonstrated to his players that he believes Dallas can win and he will go all out to make it happen.

Parcells is coaching this season like it is his last. The boxing nut coach is doing a Rocky.

From a pure management viewpoint his performance is inspiring. Very few of us manage a business like Parcells is doing now with the Cowboys. The tendency is to stay with incumbents who do the job but will never take the team to the Super Bowl. Perhaps it is impractical to run a manufacturing business like a pro football team because it is hard to judge performance from one plant to another. Statistics and video make sports performance more transparent.

But the Parcells approach this year is provocative and inspiring. When a coach or manager can invoke a sense of urgency and all-out-ness to his team, performance has to rise. The unknown is whether the feeling can last.

But maybe that really isn't the point.



Art by Shell Jackson.

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# book review

BY NOAH GRAFF

## *The Blind Side*

*The Blind Side*, by Michael Lewis, tells the story of Michael Oher, an illiterate and penniless 6-foot-5 350- pound 16 year old from the Memphis inner city who transferred to Briarcrest Christian School and became a football phenomenon.

When Michael arrived at Briarcrest, none of the coaches understood the true potential of his athletic gifts, and he had trouble finding a comfortable role on the basketball and football teams. Before Oher's senior year, Tom Lemming, the authoritative designator of All-American high school football players, saw a grainy videotape of Oher and realized Michael's rare combination of size and speed made him the epitome of the coveted left tackle position. Lemming immediately alerted the top college football coaches, and, overnight, Oher became one of the most sought after high school football players in the country.

Michael Lewis intersperses Oher's inspiring personal story with a historical and analytical study of football strategy to illustrate the importance today of the left tackle position. The left tackle position, he explains, came into the spotlight with the emergence of the legendary Lawrence Taylor in the early 1980s, who had made a career out of trying to end the quarterback's career every play of the game (which he did to Joe Theismann in 1985). Lewis says that until Taylor emerged, football offenses typically had used running backs to protect the quarterback, and, surprisingly, the running backs were often smaller, slower and weaker than Lawrence Taylor. Teams eventually realized that the left tackle was one of the most important positions on the field because it protected a right handed quarterback's blindside; therefore, it had to be upgraded to a significantly larger, quicker athlete.

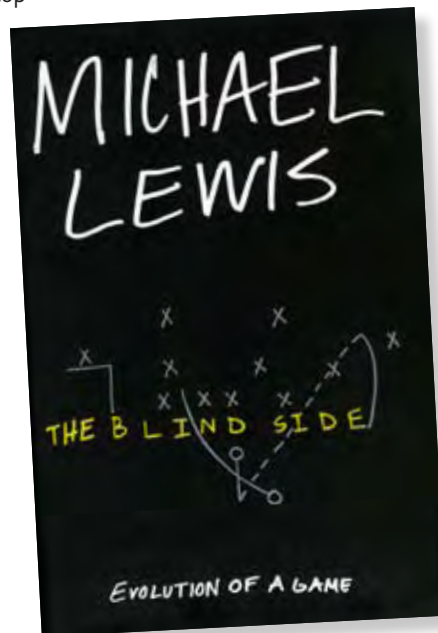
Lewis also correlates the importance of the left tackle position with the emergence of Bill Walsh's West Coast Offense, which transformed NFL football from a game dominated by the run to

one dominated by passing. When Walsh became the coach of the 49ers in 1979, he inherited the NFL team with arguably the worst starting quarterback, Steve Deberg. Deberg had led his team the previous season to a 2-14 record, completing 137 out of 302 passes and throwing 22 interceptions. Walsh's new system of short, planned routes timed to the steps of the quarterback and spreading the field horizon-

tally raised Deberg's pass completion to 60 percent, and that year Deberg threw 578 passes. When Walsh drafted Joe Montana, his engineered passing offense really thrived. However, soon after Walsh started to revolutionize the passing game, Lawrence Taylor debuted with the New York Giants in 1981 under coach Bill Parcells. Before the 49ers faced the giants that year, Walsh shrewdly replaced Dan Audick, his slow 250-pound left tackle, with his 6-foot-5-inch 270-pound left guard John Ayers. Ayers shocked the Giants by neutralizing Taylor, and Walsh and Montana looked like geniuses.

Parcells' and Walsh's teams would battle for years, pitting defensive might against innovative offensive strategy. The influence of both coaches spread throughout the league, and, by 2006, two thirds of all NFL teams had been

run by a coaching descendant of either Walsh or Parcells. The quarterback's blind side was never to be overlooked again. Lawrence Taylor summed it up best in the book: "It wasn't really called the blind side when I came into the league. It was called the right side. It *became* the blind side after I started knocking people's heads off."



Comments? You can email Noah at [noah@todaysmachiningworld.com](mailto:noah@todaysmachiningworld.com)



## Air Power

BIG Kaiser Precision Tooling Inc. has introduced Air Power Spindle, which offers maximum spindle speeds of 80,000 RPM. Air Power Spindle is an air-driven tool that can be used on existing machining centers. The new product minimizes thermal displacement in the Z-axis for top precision. When compared with a standard machining center spindle with up to .012mm of displacement, Air Power Spindle remains constant at less than .001mm.

Combined with the high-accuracy Mega Micro collet chuck series, Air Power Spindle delivers run-out accuracy of less than .002mm, even at 80,000 RPM. The spindle produces very low vibration by perfect dynamic balance and low noise design (less than 65 dB).

For more information about Air Power Spindle contact BIG Kaiser at 888-TOOL-PRO or visit the company website at [www.bigkaiser.com](http://www.bigkaiser.com).

## Chironomo

CHIRON America has introduced a series of machines for machining profiled extruded parts for the aerospace, automotive, electrical, leisure and construction industries. Parts requiring milling, drilling, countersinking, reaming, tapping, and sawing operations are completely and automatically machined in a single setup. These CHIRON systems offer 0.5 second tool changes, axis acceleration up to 2 g and rapid feed rates up to 75 m/min (2,955 ipm).

The three machines are the MPS08 (Multiple Profile System), the MPS08 Magnum, and the MPS15. Bars with cross sections from 67 x 67 mm (2.64") to 120 x 120 mm (4.72") can be accommodated to make a variety of sized parts from less than an inch to several feet long. After being placed in a loading station, the profiled workpieces are automatically transferred with an NC bar feeding mechanism. Machining occurs between the independent clamping elements of two synchronously controlled NC rotary axes and a linear axis.

For more information about the Multiple Profile Systems, contact CHIRON at 704-587-9526 or visit [www.CHIRONamerica.com](http://www.CHIRONamerica.com).



# fresh stuff



## Mazak Attack

Equipped with dual opposed spindles for turning and C-axis control, Mazak's new Integrex 100-IV ST can machine parts complete by exchanging them between spindles for front-and-back processing. You can also machine on each spindle simultaneously and turn with the upper and lower turning tools concurrently.

Integrex 100-IV ST is a full 5-axis machining center with travels of  $X=16.14\leq$ ,  $Y=5.5\leq$ ,  $Z=31.69\leq$ ,  $B=225^\circ$ , and  $C=360^\circ$ . The B-axis consists of a rotating axis containing a 7.5 HP milling spindle. It can position in increments of  $0.0001^\circ$  or under continuous CNC operation. Standard spindle speed is 12000 RPM with optional capacity of 20000 RPM. The right and left horizontal spindles are 15 HP for turning, plus continuous C-axis control. The chuck size is 6" with a top turning speed of 6000 RPM.

Also new on the Integrex 100-IV ST is the Mazatrol Matrix CNC. Software and hardware advances in the Mazatrol Matrix include internal computing speed to support 16 million pulse encoders on each linear axis for sub-micron resolution and new servo control technology that minimizes vibration.

For more information, please contact Mazak at 859-342-1700 or visit the company website at [www.mazakusa.com](http://www.mazakusa.com).

## Rockin' Roku

MC Machinery Systems, Inc. introduces the new Roku-Roku RMX-5 vertical machining center. The new machine construction is built to jig-borer standards of quality and accuracy. It features bridge construction with Meehanite GC for both the base and bridge casting material. The RMX-5 employs oil mist angular contact ceramic bearing technology. The machine is equipped with two pneumatic counter-balancers located on both sides of the spindle headstock. The RMX-5 has a 200-32,000 RPM integral motor spindle equipped with HSK-E40 tooling and industry-leading Fanuc 31i-A5 series control. RMX-5 also features Fanuc's Digital Intelligent Servo System with five-place decimal input and feedback.

For more information, contact MC Machinery Systems, Inc. at 630-616-5920 or visit the company website at [www.roku-roku.com](http://www.roku-roku.com).



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# fresh stuff



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## Stama-na

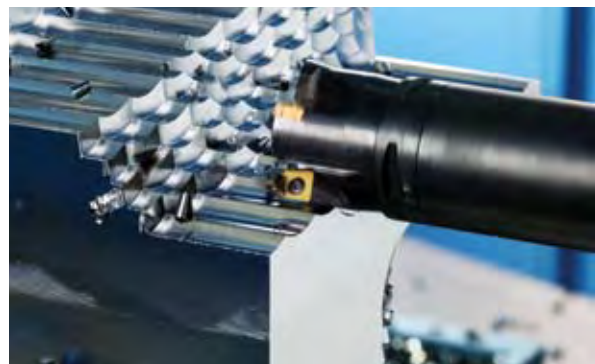


STAMA America has introduced the Model MC 726 MT, a five-axis, CNC milling/turning center designed for continuous production from bar stock of multiple and different parts, including high-precision medical devices. Featuring a 60-position tool magazine (HSK-A63) and trunnion swivel assembly, this STAMA VMC can produce complex surgical tools, implants and other medical apparatuses. In bar feeding applications, the material stock is fed directly to the rotating/swiveling trunnion positioning device. Drilling, milling and turning operations are performed on both vertical and horizontal spindles, all programmed on the CNC.

Model MC 726 MT features vertical spindle speeds up to 12,000 rpm, horizontal spindle speeds to 5,000 rpm, bar segment capacity to 800 mm length and 15-65 mm diameters, travel (XYZ) of 500 mm x 380 mm x 360 mm, A-axis of 360°, B-axis of 180°, rapid 60 m/min traverse and a compact footprint.

For more information, please contact STAMA America at 630-871-3310 or visit the company website at [www.stama-america.com](http://www.stama-america.com).

## Insert Here



Today's Machining World

Sandvik Coromant has recently added a new, positive rake cutting geometry insert to its CoroMill 210 line of milling tools. The CoroMill 210's 10-degree entering angle allows for extreme feed rates at small axial depths of cut when face milling. The design also allows for high radial depths of cut when plunge cutting in rough operations. The design of the CoroMill 210 cutter body allows for the use of screws with coolant holes to provide through-the-tool coolant supply to each pocket.

For more information contact Sandvik Coromant Company at 201-794-5223 or visit the company website at [www.coromant.sandvik.com/us](http://www.coromant.sandvik.com/us).

## Head of the Class



TPS International has introduced a new radial drilling head specifically designed for the Hydromat Epic series transfer machine which features 3-axis CNC machining unit movement. The head mounts to the standard tool spindle and does not impact the space of adjacent machining stations. The head is available in 2, 3 or 4 spindle versions.

For more information, contact TPS International at 800-423-4031 or e-mail [info@tpsintl.com](mailto:info@tpsintl.com).

## Thread Whirl

ETCO/Engineered Tooling Corporation has introduced its new thread whirling line of indexable inserts and cutter bodies. These are made to be used with Swiss-style CNC

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## Tiny Footprints



Mori Seiki has released the new NXH3000 DCG™ horizontal machining center and NXV3000 DCG vertical machining center, both with footprints of under 30 sq. ft. and a height of 9.8 ft. Both machines feature axis travels of 11.8" x 13.8" x 13.8" (X x Y x Z) with a 12.6" x 12.6" table that supports workpieces up to 440 lbs. The machines feature a uniform table height of 39.4", allowing all machines in the series to be combined in the same production line.

Mori Seiki has implemented DCG (Driven at the Center of Gravity) technology into every machine within the NX Series. This, along with a box-in-box construction, allows for rapid acceleration/deceleration rates with minimal vibration. Rapid traverse rate is 1,969 ipm along all three axes for each machine.

For more about Mori Seiki, visit [www.moriseiki.com](http://www.moriseiki.com) or call 847-593-5400.



# fresh stuff

## Dynamic Dual

The NEW Tsugami BE12 Swiss-turn model has spindle speeds up to 12,000rpm, three standard 8,000rpm cross drills and a Y-axis milling function. The BE12's Dual Path Control simultaneously operates the main and sub spindles. The BE12 can be run with or without a guide bushing. In chucker mode, the BE12 is ideal for complex short parts and does not require ground stock.

Tsugami's BE12 has automatic lubrication, no hydraulics, and air/oil mist lube to rotary bushing and live tools. Programs can be run manually with manual pulse generator Program Check Function before an actual cut is made. BE Abile Programming Software allows the user to cut parts with 3D graphical prove out. No CAD experience is needed to use this software, as it utilizes a simple building block approach to drawing a part.

For more information, please contact Tsugami/REM Sales at 860-653-0071 or visit the company website at [www.remsales.com](http://www.remsales.com)



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# Not a Chance

## Score One More for the Great American Mousetrap

BY ROBERT STRAUSS



"I guess you could call me the Head Rat," said Andy Woolworth, whose rather more official title is Executive Vice President of the Woodstream Corporation. "I think I have the best job in America."

Arrayed around Woolworth in the Woodstream conference room were some of his favorite Woodstream products – all of which are meant, in various ways, to get rid of mice. The most basic of these is the Victor EASY SET®.

"It is, to be frank, what people think of when they think, 'Mousetrap,'" said Woolworth. "It is an American icon, and I am just proud to be the person in charge of selling it."



Since it was invented about 100 years ago, the EASY SET®, with its signature red “V” prominent, has been the slayer of more than a billion mice.

“At a price point of about two for a dollar, it is the simplest, cheapest way of getting rid of mice,” said Woolworth, not with the maniacal tone of an executioner, but more the matter-of-fact chant of a businessman. “Even though, as they say, we are always looking for a better mousetrap, we know we have an awfully good one here.”

Though it is cliché, there has been little that has symbolized American ingenuity more than the attempt to build the perfect mousetrap. Ralph Waldo Emerson was widely, if incorrectly, quoted as saying, “Build a better mousetrap and the world will beat a path to your door.” (What he actually said was, “If a man has good corn, or wood, or boards, or pigs to sell, or can make better chairs or knives, crucibles or church organs than anybody else, you will find a broad, hard-beaten road to his house, though it be in the woods,” but a later biographer distilled it to the “mousetrap” version, which people seem to like better.)

“That’s why I think inventors still try to build the mousetrap,” said Woolworth. A few dozen of them try Woodstream every year, and, in fact, Woolworth said the company is working with a few inventors for refinements on its traps and other pest control devices the company makes under different brand names.

“They have heard the line so often that it peaks their interest. It is truly American to think you can do something perfect, and the mousetrap signifies that,” he said. “But we make more mousetraps right here in Pennsylvania than any company in the world. And we are always looking for something better.”

Woodstream started as an outgrowth of the Oneida Community, one of the first utopian communes, in up-state New York. A commune member, Sewell Newhouse, developed the first high-quality leg-hold trap in 1848 and

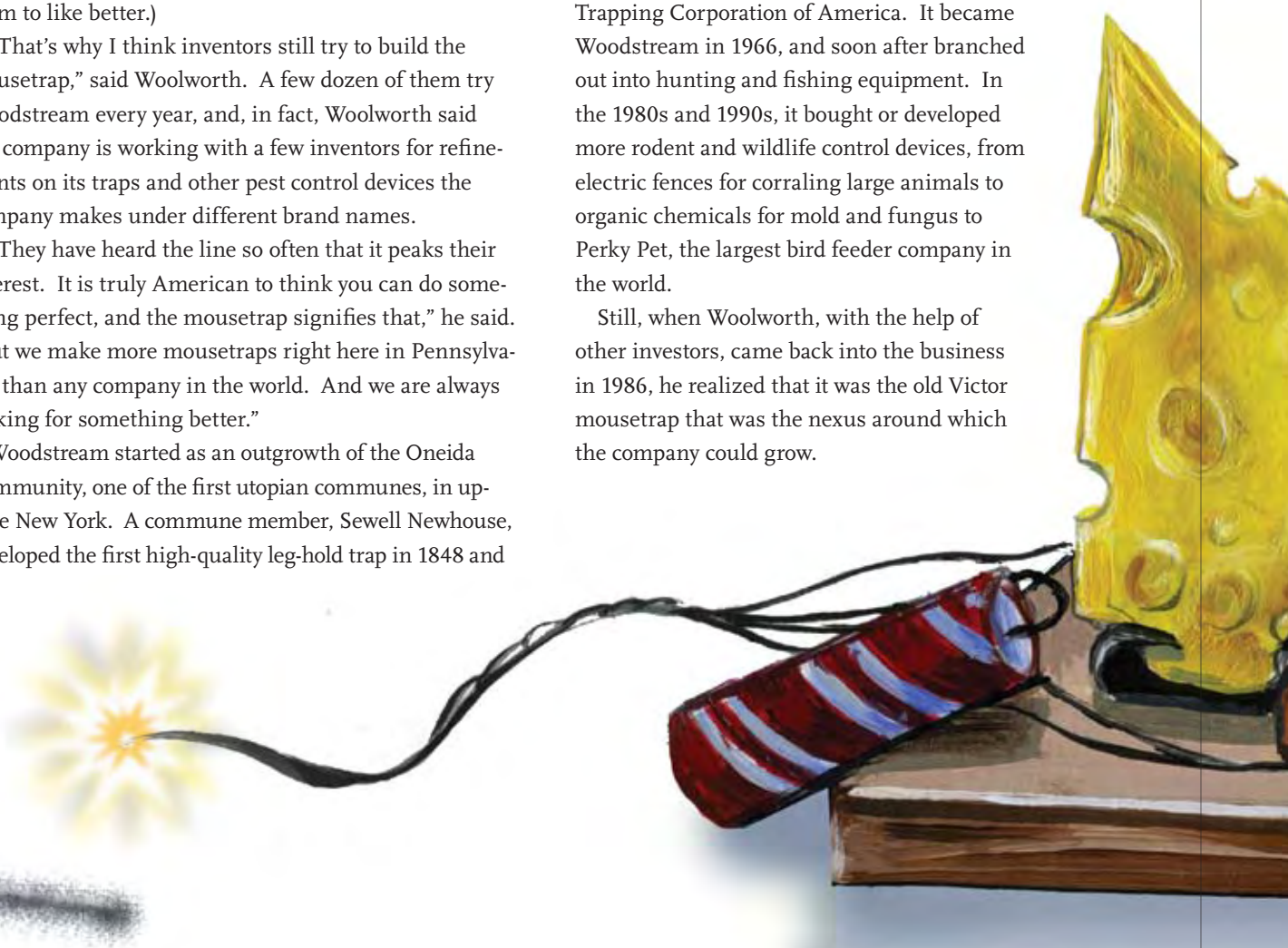
started marketing it to traders and trappers then exploring the Great Northwest and the Mississippi River basin.

The Newhouse traps, with silver and steel, became famous throughout the West, but by the latter part of the 19th century and early 20th century the business itself died down, and the Oneida company started making cutlery instead. Along the way, though, it acquired other trapping-type businesses, one of them being the Mast Mousetrap Company in Lititz, Pennsylvania.

In 1899, in response to continuous infestations of mice in a neighboring popcorn factory, John Mast tinkered around and finally came up with a heavy spring-steel wire mechanism. He bolted it to some wood and put some cheese on a miniature platform on the front. When the mouse sniffed around the cheese and stepped on the platform – pow – the spring would smash down on his neck, killing him almost instantly.

Woolworth’s grandfather bought the firm, which was by then selling most of the leftover trapping equipment as well in 1920, calling it the Animal Trapping Corporation of America. It became Woodstream in 1966, and soon after branched out into hunting and fishing equipment. In the 1980s and 1990s, it bought or developed more rodent and wildlife control devices, from electric fences for corralling large animals to organic chemicals for mold and fungus to Perky Pet, the largest bird feeder company in the world.

Still, when Woolworth, with the help of other investors, came back into the business in 1986, he realized that it was the old Victor mousetrap that was the nexus around which the company could grow.



“Like I said, you see that red “V” and you know you have a product that everyone can associate with,” he said. “It just makes you want to, well, build the better mousetrap.”

Though he had grown up in nearby Lancaster and had the opportunity to go into the business as a young man, Woolworth chose instead to go to Harvard University – where Ralph Waldo Emerson himself had matriculated a century-and-a-half before – majoring not in business, but English literature. He took jobs in New England before returning home to work with Woodstream in 1986.

Lititz is the perfect home for the better mousetrap saga. It grew out of a Mennonite center of the mid 18th century, when the Germans – popularly known as the Pennsylvania Dutch – settled the hilly farm areas a day’s horse and buggy journey west of English Quaker Philadelphia.

“This has long been an area of hard workers with generally conservative mindsets and religions,” said Woolworth. “Mennonites, Amish, even Quakers, all had that work ethic. Not everyone is Mennonite now, or even German, but I think somehow we have continued here to have that idea that hard work and smart work pays off. We have never had trouble having good employees who want to make the product better.”

The town has a population of only 9,000, but is headquarters to an impressive variety of industries – from Sturgis Pretzels, which claims to have the first pretzel bakery in America, to Wilbur Chocolates, which makes some of the elite Godiva products, to Clair Brothers and

Tait Towers, which do sound systems and staging for theatrical and rock and roll acts worldwide.

Downtown Lititz is full of antique shops,

churches, and bed and breakfasts, many in buildings that date back to the 18th century.

“I think we also have one of the best weekend farmers’ markets around, too,” said Woolworth, a thin, but muscular man with only slightly greying hair. “I would say, without question, it is a Norman Rockwell kind of town.”

Except it has the Head Rat, and he is out to get every darned rodent he can find.

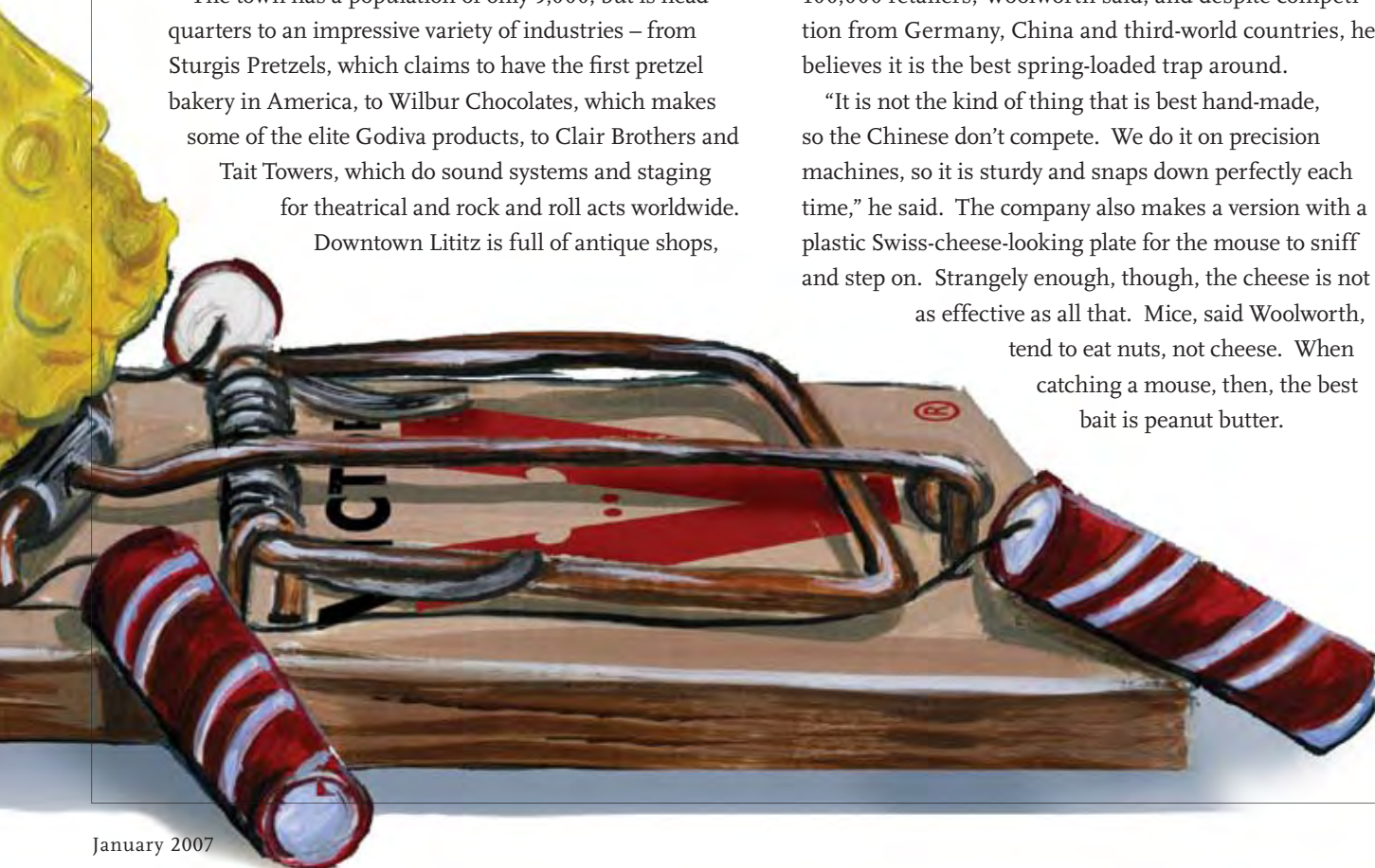
“Actually, rats are harder. Rats and cockroaches will be there when the final holocaust hits. They seem to be able to survive most anything,” he said, and then an almost maniacal grin comes on his face. “But mice, well, mice are more fragile.”

The problem with mice, said Woolworth, is that they multiply quickly. They reach maturity in 45 days and can procreate every six weeks, with litters of up to five each time. “You can see, if you don’t get them early, it can be a real problem,” he said.

Woolworth likes to show off the Victor line in size and sophistication progression. First, to be sure, is the Quick Set, the old hard spring standard with the red “V.”

“It is still the standard, and there are still more of them around than any other kind. It is an effective low-cost way to rid the millions of mice invading people’s homes,” he said. Woodstream sells them to more than 100,000 retailers, Woolworth said, and despite competition from Germany, China and third-world countries, he believes it is the best spring-loaded trap around.

“It is not the kind of thing that is best hand-made, so the Chinese don’t compete. We do it on precision machines, so it is sturdy and snaps down perfectly each time,” he said. The company also makes a version with a plastic Swiss-cheese-looking plate for the mouse to sniff and step on. Strangely enough, though, the cheese is not as effective as all that. Mice, said Woolworth, tend to eat nuts, not cheese. When catching a mouse, then, the best bait is peanut butter.



"But I don't think Skippy is going to partner with us any time soon," he said with a chuckle. "I think they want to have Mickey Mouse smiling and eating Skippy, not some mouse ready to die."

The next step up are the Quick Set and the Quick Kill mousetraps, plastic contraptions that have lids over the bait areas. The mouse goes after the bait, setting off a lever that rigs the lid to smash over him. On the Woodstream website ([www.victorpest.com](http://www.victorpest.com)), the Quick Set and Quick Kill – two somewhat similar styles of effective mouse execution – go for \$3.99 to \$4.46 for a two-pack, while the Easy Set sells for \$2.25 for a four-pack. Woolworth said his up-and-coming market, women and the elderly, go for the Quick Set and Quick Kill more often.

"You know, they don't want to see eyes bulging and tails coming out," he said. "Women and the elderly are growing markets for us, what with the differences in living situations these days, so we want to cater to them. This way, they just pick up the trap, don't see the mouse, and throw it away."

Woodstream also caters to another group – those who want their mice caught alive and put back in the wild. The Poison Free trap is a maze of sorts that, when baited correctly, traps up to four mice, but neither suffocates nor has a snap mechanism to kill them, allowing the trapper to release them far enough away from the house so as not to have them return.

"That way, even the PETA folks have an alternative," said Woolworth.

Woodstream also sells glue traps – either glue-backed pads or plastic containers with nut-sprinkled glue, but even Woolworth disdains them, except in dire situations.

"I agree with the PETA people with the glue," he said, noting that when a mouse gets stuck, it often takes a couple of hours for him to die, either from dehydration or through a stress-induced heart attack from not being able to get out of the deadly glue pit. "Unless there is a big infestation, I would be a bit more humane and go for the quick kill."

The new big item, though, is the Victor Electronic Mouse Trap, which can be used again and again for those nasty rodent invasions.

"My marketing people convinced me that there was a market for a 20-dollar trap. I wasn't sure, but now, after a few years, I guess there is one," he said.

Four double-A batteries power an electrode that shocks a baited mouse to instant death. The mouse has to go through a mouse-hole-shaped passageway to get to the bait, a wedge so small that even a kid's finger can't get in. When a mouse gets caught, a light flickers for as long as 24 hours. The trapper then opens a lid and the electricity stops, so no human gets shocked. The mouse gets trashed and the Electronic Mouse Trap gets reset.

"It becomes cost effective when you have a lot of mice, since you can use it 50, 100 times," he said.

Finally comes the Ultrasonic Pest Chaser, which basically looks like a speaker inside a two-inch diameter white plastic circle. It goes for about \$16 and delivers a crushing aural blow to a rodent.

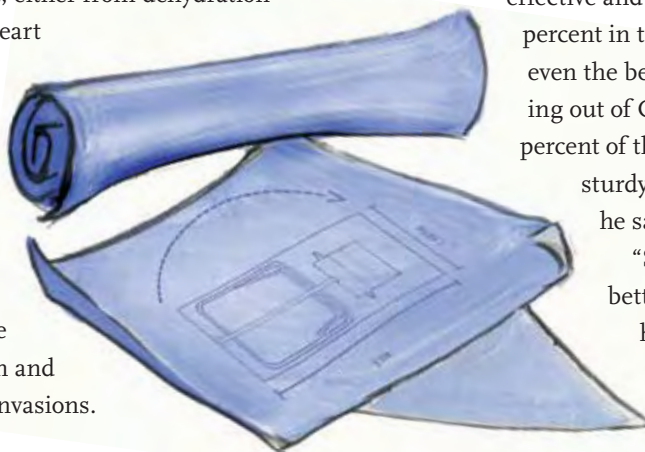
"It is such a high frequency that even dogs and cats can't hear it, and it rings at 103 decibels for a mouse, so it is like a foghorn combined with nails on a chalkboard, an unbearable cacophony," he said. It does not kill the mouse, but drives him far away. "Although if you have guinea pigs or pet mice, you don't want to buy this, because it will drive them nuts."

Woolworth, though, said he is never going to sit on his snap-trapping laurels, that someday, somehow, there may well be a better mousetrap out there.

"We think we know everyone in the field and that most of the innovation comes right off our own floor," he said, noting that even the EASY SET® trap has had minor fixes along the way from one or more of the 300 Woodstream employees in Lititz. "I won't tell you the secrets, but each time, it has gotten better."

He claims that the EASY SET® traps are 88 percent effective and the Quick Sets are up to 92 percent in trapping nearby mice, while even the better handmade brands coming out of China only get their prey 40 percent of the time. "They are just not sturdy enough. That is our key," he said.

"Still, there may always be that better one," he said, "and we just hope when it comes, it comes right to us."





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BY LLOYD  
GRAFF

# A Leadless Machining



**LG: I AM WITH MILES FREE OF THE PMPA, AND WE ARE TALKING ABOUT THE UNLEADED WORLD OF MATERIALS. IS LEAD TO STEEL AS TRANS FAT IS TO FOOD?**

MF: It seems to be; although I don't know what benefit trans fat gives to food. We can certainly document the energy savings that lead gives to steel for machining, let alone brass and aluminum. The state religion seems to be "lead is bad."

**WHERE DID THIS COME FROM?**

It comes from the European Union's belief in the precautionary principle on lead. It's kind of disturbing. The EU says when an activity raises threat to human health or the environment, precautionary measures should be taken even if some of the cause and effect relationships are not fully established scientifically. To me this is really a state of faith that any suspicion of any threat to the environment really trumps the lack of scientific evidence that the threat really exists. They've turned the burden of proof upside down and said, "Prove absolutely that your product is harmless."

**IT SOUNDS LIKE GLOBAL WARMING.**

Very much so.

An interview with Miles Free,  
Director of Industry Research  
and Technology for the Precision  
Machined Products Association.

# World?

**SO WHAT IS THE UNDERLYING SCIENTIFIC HUNCH ABOUT LEAD?**

I don't know in terms of what its proposed mechanism for environmental or personal harm is in machined parts. Lead was a real problem from tail pipe emissions, but that lead was reduced 96 percent with unleaded gas. Lead got its face on a reward poster that it's a bad actor. I don't know how many children in Europe are expected to ingest screw machine parts. I don't know how many cars have to end up in an acid bog to raise the net level of lead. I don't get it.

**BUT WE'RE LIVING IN THE REAL WORLD WHERE A BUREAUCRATIC DECISION IN BRUSSELS AFFECTS ALMOST EVERYBODY IN THE MACHINED PARTS WORLD.**

It does because it affects our industry. It affects our costs, our choice of materials and processes, and it can affect the life of service that our parts are going to have.

**LET'S SAY YOU HAVE A SHOP IN DETROIT AND YOU'RE MAKING A PART THAT GOES INTO BOTH AMERICAN, EUROPEAN AND JAPANESE CARS, SOME OF WHICH ARE SOLD IN SPAIN, AND YOUR CLIENT MANDATES THAT THE PARTS MUST BE MADE FROM MATERIALS WITH NO LEAD. WHAT DO YOU DO?**

Well this is round one of Don Quixote's adventure because the European regulations don't actually say, "No lead." There's a couple of regulations that apply. The "End of Life Vehicles" directive would apply to your example. End of Life Vehicles specifically exempts lead up to 0.35 maximum weight as a percent for steel. It doesn't ban lead.

**SO DOES A FELLOW AT THE END OF THE FOOD CHAIN IN DETROIT HAVE ANY RECOURSE IF HE IS MAKING A COMPONENT THAT GOES INTO A TRANSMISSION THAT MAY BE SOLD IN SPAIN, AND THE BUYER TELLS HIM "NO LEAD"?**

What's really going to happen is the automaker is going to send a document demanding that the part maker certify that his part is compliant. The irony of that is the automaker, the OEM, says, "Make this part out of Grade A," and now they're demanding that the part manufacturer certify that Grade A actually meets the requirement. In many cases the customer has no idea what the heck he specified. So the shop owner in Detroit literally has to be more of an expert about this than his customer. That's what we've helped do at PMPA. We've outlined the requirements and the exemptions and prepared some suggested wording so that when one of these "thou shall comply" letters come in you can answer it with diligence that protects your ability to still make the part.

**IN THE REAL WORLD, WHAT DOES IT MEAN?**

In the real world, if it's a 12L14 part, the machining guy says, "It's exempt by the End of Life Vehicle standard in the annex per Article 4.2" and he continues to make it out of 12L14. Despite the fact that they banned lead, they've made a big exemption for leaded steel.

**SO YOU'RE SAYING THAT THE EU DIRECTIVE HAS A BIG HOLE IN IT AS FAR AS STEEL IS CONCERNED. WHAT ABOUT ALUMINUM?**

It's the same thing. For the "End of Life" Vehicle standard the original wording exempted aluminum for machining purposes allowing lead content up to 2 percent by weight. That expired in July of 2005; then it had an aluminum for machining purposes exemption with lead content up to 1



percent by weight that is supposed to expire July 1, 2008. I just received a brochure from Alcoa Global, and they're saying that the requirement for the exemption is 1.5 percent until 2008. So aluminum with lead is okay too.

**BUT THERE ARE SOME COMPANIES TAKING THE NO TRANS FAT APPROACH AND GETTING MORE AGGRESSIVE ON THE ELIMINATION OF LEAD.**

Absolutely. It makes them feel good to do that. But they aren't helping their company in terms of competitive pricing, and there's really no science that says they've done the environment any good. Show me the benefit of that approach other than making you feel good. It's kind of like the minimum wage. You can vote the minimum wage up all you want but at some point an employer decides whether or not you're worth it. So these guys are ignoring the benefit that the lead in the material gives them in terms of part quality and part price.

**I AGREE WITH THAT, BUT DO YOU THINK THE USE OF UNLEADED MATERIALS OR EXTREMELY LOW LEAD MATERIALS APPEARS TO BE SPREADING?**

Yes. There are aluminum grades that have had to be modified in order to meet the EU requirements, and there are certainly a lot of people using 1215 instead of 12L14. Laurel Steel has a tin additive steel. They've had success with their product in some applications.

**IN ALUMINUM, WHAT OTHER SUBSTITUTES ARE THERE FOR LEAD?**

The standard grades allowed up to 0.6 percent lead content, and the EU requirements of 0.4 percent (in RoHS and WEEE) made those grades not suitable for application, so some of them have been modified to reduce the lead content. 2011-T3 now has a low lead variety with .20 to .40 lead and .20 to .60 bismuth, so they've brought that maximum lead range down in order to comply with the European application. Alcoa has a C06N, and they've got .40 max lead on that.

**IS THERE ANY MATERIAL OTHER THAN LEAD THEY'RE PUTTING INTO ALUMINUM BAR NOW?**

Bismuth isn't spelled out in the European regulations, so on a couple of the grades bismuth is in there as an adjunct to the lead.

**WHAT DOES THE BISMUTH DO?**

It has very similar mechanical properties and physical properties to lead, so it acts much the same way in the material during machining as the lead would. Bismuth had been added to leaded steels in the past. U.S. Steel had a product called Mach 5 with a lead and bismuth combination, and Inland had their INCUT™ series that featured bismuth instead of lead. Aluminum is showing this bismuth addition as well.

**DOES BRASS HAVE LEAD IN IT?**

In their wisdom, the people in Europe have said that brass can have up to 4 percent lead and be exempt from the "End of Life Vehicle" requirement, but aluminum can have no more than 0.4 percent. So apparently little children in Europe can safely ingest lead out of brass at a level ten times that of aluminum.

**CAN YOU MAKE BRASS WITHOUT LEAD?**

You can make brass without lead. Chase Brass has a lead-free brass called Eco Brass™. They substitute some other elements for lead to get machinability. But like every new technology there's an implementation ramp up. You cannot mix the non-leaded brass with the leaded brass scrap, so you need to maintain a separate system for handling non-leaded brass. The elements that make it free machining in that incarnation actually work against it if it gets into the traditional leaded scrap stream – and that's where the bulk of the market is.

“ To eliminate lead means we need to change our setup to reduce the speed since the lead is acting as a lubricant, allowing the material to be cut at a faster surface footage. Taking that out means we're no longer cutting up forgiving material. ”

**LET'S TALK ABOUT APPROACHES TO CUTTING UNLEADED MATERIALS. I HAVE BEEN TOLD BY CLIENTS THAT IT IS MESSIER – MUCH MORE DIFFICULT TO MACHINE.**

Well, if you were to change from leaded steel, 12L14, to unleaded – say 1215, we'd really want to look at what's going on. First off, your readers are all going to have a different definition of what machinability is.

**WHAT IS YOUR DEFINITION?**

My definition is the ability of material to travel through the shop starting as bars, ending as parts and causing the least amount of aggravation and trouble for the machine and the machine operator.

Now, the shop's purchasing agent doesn't really care – he just wants the lowest price. Meet the spec and those guys in the shop can worry about it. We're going to work on the machinist definition. But first, we need to say one thing about hardness. A lot of people are careless in the way they use the term hardness. They'll say, "Unleaded is harder to machine" or "This is hard to cut." As a technical person, my definition of hardness is "resistance to indentation." It's resistance to penetration. Hardness is not a synonym for difficult. Hardness is not the difference between the

machinability. The hardness of grade 1215 is 167 Brinell. The hardness of 12L14 is 163 Brinell. Trivial difference. What we need to look at is what the lead actually does, which is to allow the material to be run at higher speeds. I've got an old Monarch manual *Feeds and Speeds for Better Turning* and here's a quote from it: "Cutting speeds can normally be increased from 15 percent to 25 percent above those employed for turning a non-leaded grade."

Lead boosts machinability about 25 percent at low cost. So if we take out the lead what does that do to the material? To eliminate lead means we need to change our setup to reduce the speed since the lead is acting as a lubricant, allowing the material to be cut at a faster surface footage. Taking that out means we're no longer cutting up forgiving material. So if we're going to go to a non-leaded 1215 material or a non-leaded equivalent, we're going to reduce the speed. Make up the volume removal by increasing the feed. Speed equals heat, and heat is bad. Cycle times have been improved by lead because lead allows you to run at a higher speed. It lubricates. It melts at around 648 celsius. It has a low melting point, so during the cut it creates a liquid phase that can act as a lubricant in place. It reduces friction, pulls a little heat out by melting, and there is a theory that it helps to create the next chip by a process called liquid metal embrittlement. It really is doing a lot of work to make the material machinable by the machinist's definition. Mostly it's acting as an internal lubricant, reducing friction. The coping strategy to move from 12L14 to 1215 is to reduce the speed, so let's increase the feeds. The result would be to have similar cubic inches of removal and less heat.

#### **CAN YOU ALSO COMPENSATE WITH DIFFERENT COOLANTS?**

You can do that by applying high pressure/high volume coolants. There are a lot of strategies you can use to help make that change. But I'm limiting my comments to what I'm going to do without adding new technology. The tool wear is going to change. 12L14 would have a lower rate of tool wear than 1215 would. So if I'm a guy in the shop, I'm going to look at the way I've tooled my job up and say, "Well maybe I should use easier to replace tooling, maybe I need to get a higher grade of tool or a tool with improved coating to keep me even with where I was before."

#### **ONE OF THE UNINTENDED CONSEQUENCES OF THE MOVE TO UNLEADED STEEL IS THAT PEOPLE ARE GOING TO SWITCH TOOLING. IT MIGHT ACTUALLY BE A BOON FOR SOME OF THE CUTTING TOOL MANUFACTURERS WHO DEVISE A BETTER MOUSETRAP.**

It may require that. If somebody's operating in the middle of the range on 12L14, maybe they won't notice much of a difference. But if somebody's a sharp operator they may need to upgrade tooling, coatings, maybe change geometry to increase the rate that they're cutting. Screw machine parts are priced based on uptime per day as well as cycle

time. Taking the lead out we're saying, "We're going to increase downtime per day." The other consequence of taking the lead out is that the new work is going to be operating at a higher cutting temperature. This is where your point about improving the coolant or improving the coolant delivery comes into play.

#### **WHO DO YOU THINK THE WINNERS ARE GOING TO BE IN THE MOVE TO UNLEADED STEEL?**

I think the people who understand the true economics and understand the true requirements and are able to see through this "feel good, lead is bad" strategy are going to be able to run their equipment at their equipment's best, using a grade that's acceptable to the EU requirements. The guy who just slavishly obeys and says, "Okay, I'm going to try and make it out of 1215 because you don't want lead," won't be competitive, and his compliance won't gain him anything necessarily. So the buyer and the component maker need to have the dialogue. That's why the PMPA prepared a Business Intelligence Report on the subject, so that people can say, "Look, is this a real need or is this just somebody's interpretation?" when in fact the Annex to the directive says, "I'm allowed to use lead in these normally expected levels."

#### **SO STRATEGY ONE IS TO ANALYZE THE PROCESS AND APPEAL THE MATERIAL.**

I never say denial is a good first step, but in the case of saying that this job requires no lead, if it's for a vehicle application, End of Life Vehicles clearly allows leaded steels, aluminums and brasses at conventionally acceptable levels. Same for RoHS (Restriction of Hazardous Substances) and WEEE (Waste Electrical and Electronic Equipment) directive. So to take somebody's quick read that this means no lead is to really shoot yourself in your productivity because you're not going to be as productive without lead as you will with the stuff. The EU directives allow leaded steels, aluminums and brasses at conventional or modified, but commercially available lead levels.

#### **SO SOME PEOPLE MAY SAY, "OH, I'M NOT EVEN GOING TO BID THAT JOB" AND OTHER PEOPLE ARE GOING TO SAY, "UH-HUH, THERE'S AN OPPORTUNITY HERE. LET'S DELVE INTO THIS A LITTLE DEEPER. WE REALLY WANT THIS JOB. LET'S FIGURE OUT HOW WE CAN GET THE COMPETITIVE ADVANTAGE BY ASSESSING THE MATERIAL ISSUE."**

Absolutely – understanding the job. Contract review is key in everybody's business. But to have the courage to say, "Well, Mr. Customer, you realize that this doesn't really say that it forbids lead. It says, 'I can use lead up 0.35 weight percent and here's how I'm going to do it.'" That's what the winners will say.



**THANK YOU VERY MUCH, MILES.**



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BY NOAH GRAFF

next

## In 50 years, will global warming have had any positive effects on Americans?

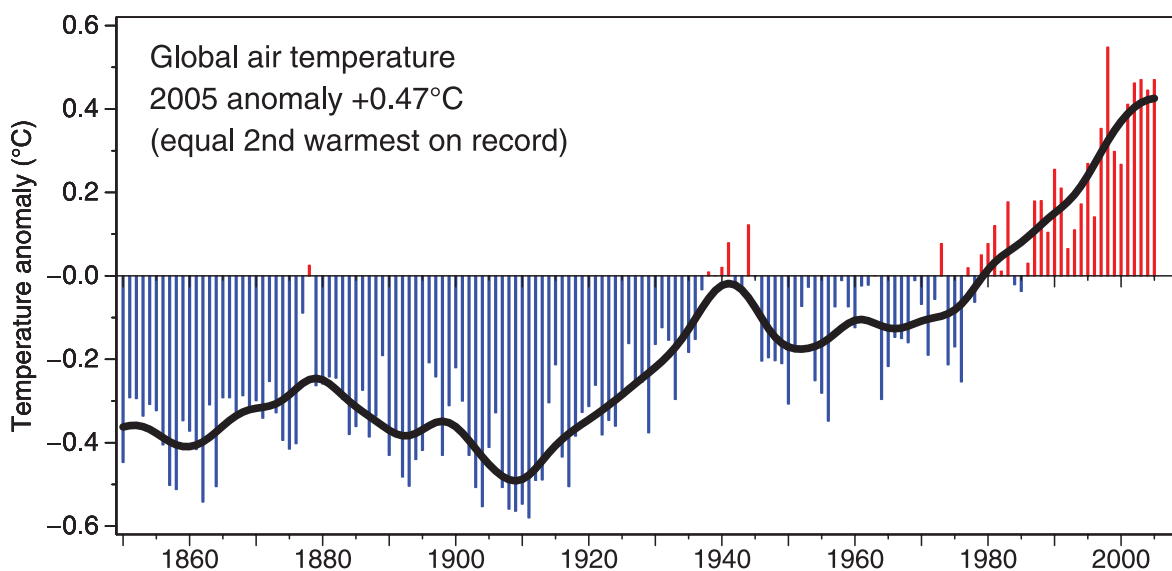
*A consensus of scientists have concluded that the Earth's mean temperature is warming at an alarming rate, drastically threatening the wellbeing of future generations.*

We have one global atmosphere; it is a global commons, and changes that have occurred in its composition and which are projected to occur have potentially dire consequences if planning is not adequate. If we can slow down the development of global warming and at the same time put in place planning for adaptation to the inevitable climate changes that are coming, then it may well have some positive effects. For instance, a warmer climate could allow a longer growing season, which could enable various new crops and activities. Who knows, perhaps in this new climate, a plantation could be cultivated in 30 years instead of 50.

Kevin E. Trenberth  
National Center for Atmospheric Research  
Boulder, CO

Americans may enjoy such things as warmer winters and lower energy demand for heating. Crop and forest productivity may increase in some areas due to increased carbon dioxide in the atmosphere and an extended growing season, but the expected negatives of global warming far outweigh the list of positives. For example, increases in the frequency of heat waves are likely, which would increase the demand

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Compiled by the Climatic Research Unit at University of East Anglia and Hadley Centre of the UK Meteorological Office.

for air conditioning. In various parts of the nation, cold weather recreation such as skiing will likely be reduced. A loss of coastal wetlands from sea level rise will likely put coastal communities at a greater risk of storm surges. Reduction in snowpack in the western U.S. will likely alter the timing and amount of water supplies, potentially exacerbating water shortages and conflicts. Continued thawing of permafrost and melting of sea ice in Alaska will likely further damage forests, buildings, roads and coastlines, and harm subsistence livelihoods. There are also likely to be changes that cannot be anticipated at this time.

Jay Lawrimore  
National Oceanic & Atmospheric Administration (NOAA)  
Asheville, NC

Although most Americans hear about how harmful global warming will be in the next 50 years, it is likely that it will be beneficial, at least to some Americans. For example, it is very likely that farmers will see an increase in productivity associated with the slight warming and increased carbon fertilization over the next 50 years. The timber industry will also see gains as forests are expected to expand and grow faster over this period. Americans living in cool locations (northern or high altitude) will also see some gains in lower heating bills from warming. Most manufacturing industries, however, will hardly be affected by global warming as they are not climate sensitive.

Professor Robert Mendelsohn  
Yale University  
New Haven, CT

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Carbon dioxide absorbs infrared radiation. Most of the energy that escapes Earth's atmosphere comes in this form, so extra CO<sub>2</sub> (from the world's increasing use of fossil fuels) means more energy absorption and an overall increase in the planet's temperature.

[www.howstuffworks.com](http://www.howstuffworks.com)

Surface temperature increases are projected to increase 1.8-6.3 degrees Fahrenheit in the next century. However, if carbon dioxide emissions continue to increase at present rates, a quadrupling of pre-industrial CO<sub>2</sub> concentration will occur not long after the year 2100. Projected temperature increases for such an atmospheric concentration are 15-20 degrees Fahrenheit above the present day mean annual global surface temperature.

[www.whrc.org](http://www.whrc.org)

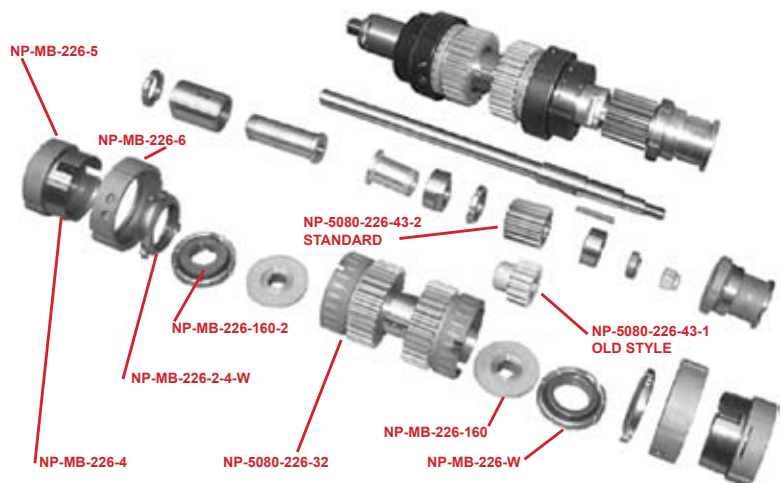
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# Christine Todd Whitman

served as the EPA administrator under President Bush from 2001-2003 and was the Governor of New Jersey from 1994-2001. Currently she heads the Republican political action committee, It's My Party Too, and is president of the Whitman Strategy Group, an organization which helps corporations deal with environmental issues.

**Christine, would you summarize the mission of the Whitman Strategy Group?**

We focus on helping businesses, utilities and local governments improve their environmental profile, helping them find ways that they can cut their emissions into the atmosphere with programs which they might not have known about. We also introduce them to new technology from time to time.

**A lot of the manufacturers who read our magazine face a great deal of difficulty with the EPA and OSHA. Can you tell me what a small company can do when faced with expensive environmental problems?**

Often the problems companies face can be avoided. They just need to know where to look and what to look for. Companies often feel they need to go to the top person in the region or in the state. The decision-maker is usually further down the line, and they're apt to get a better hearing there than if they try go to the top person.

**Ideally, how would you change the EPA to be friendlier towards businesses?**

I would allow more opportunity for the agency to work creatively in the private sector. That is not to say that we don't still need regulations and that we don't still need enforcement.

**What do you think of the new regulations passed in Europe outlawing lead in car parts?**

An issue we've always had with the way the European Union and many European countries address environmental issues is their precautionary principle. The problem is that this philosophy assumes something bad from anything produced and it says that you've got to get rid of it before you even know the problem. Lead is a significant problem, but until you have an appropriate alternative for it, the real issue here should be appropriate recycling of the lead.

**Although you're a Republican, do you feel your views are closer to those of the Democratic Party regarding environmental or women's issues?**

The environment has always been a Republican issue, starting back with Roosevelt. The Environmental Protection Agency was started by Richard Nixon. The majority of environmental regulating laws were signed by Republican presidents working with a Congress largely held by the other party.

**What do you think of George Bush?**

He's somebody who truly believes his convictions. He focuses on a goal, and he is determined to get there. And, he is very loyal to the people who have been loyal to him.

**If he was running today would you vote for him?**

I never reveal who I vote for. Nice try.

**Why did you resign as administrator of the EPA?**

One reason was that my husband and I really did not like the bifurcated marriage we had. But there were regulations that were about to be promulgated that I had been working on for two and a half years which I felt very strongly about that were going to end up in a place where I just wasn't comfortable. The president had an absolute right to set policy. He was elected, not me, but he also had a right to have an administrator who could implement those policies with a clear conscience, and I just couldn't have signed that regulation.

**Of all the jobs that you've had, which has been the most fun?**

Governor, without a doubt. The governor of New Jersey was constitutionally the most powerful. Your ability to make a difference, really shape policy and see it through is enormous. And that is very challenging, exciting and satisfying.

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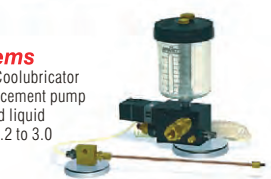
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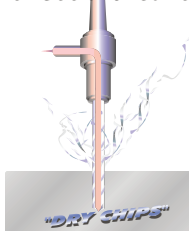
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how it works

BY BARBARA DONOHUE

# Setting Up a Green shop

Environmental  
friendliness from  
the ground up

A green shop? What does “green” mean? Green means having the minimum adverse effect on the environment; which includes the air, water, soil, plants, animals and people around us. For example, when you travel in a wilderness area, green means, “Take only photographs. Leave only footprints.”

Can a machine shop be green? Yes, it can. In business or manufacturing, being green means using a minimum of energy and material, throwing away as little as possible, and making sure what you do throw away won't harm the environment. A machine shop can certainly do these things.

New Hampshire Ball Bearings, Inc. (NHBB), Peterborough, N.H., is a prime example of a company which aspires to do business the green way. With the wholehearted support of its Japanese parent company Minebea, this manufacturer of roller and ball bearings for civil and military aerospace applications is committed to sound environmental management and has participated in the Environmental Protection Agency's Performance Track program since it began in 2000. The Performance Track program recognizes top environmental performance in many areas, including some that are not currently regulated, such as energy use and water consumption. “It's really going above and beyond compliance,” says Patti Carrier, environmental and facilities manager at NHBB.

### Follow the green road

Yes, a company can take environmental friendliness beyond compliance with state and federal regulations. Before building your green shop, have in mind your goals for environmental standards and the strategies you will use to achieve them, whether they be conserving energy on the line or minimizing the amount of paper used in the office. A formal "environmental management system" for your new shop can help clarify and focus your efforts. Many companies seek certification to ISO 14001, the international standard for environmental management systems.

### It starts with the building

From the ground up, to create a truly green machine shop, you need to start with a building designed for energy efficiency and constructed of materials that are recycled or can be reused in the future. It needs to be sited so it can take advantage of the sun for light, and, in cold climates, for warmth. It also needs to be well-insulated and have the most efficient heating and cooling systems possible. Plan landscaping to shelter the building from the prevailing winds and perhaps to provide shade from the summer sun. Plants need to be drought-tolerant, pest-

# how it works

resistant and able to flourish without the use of chemical fertilizers or pesticides.

Your location should be as near to the homes of your labor force as possible to minimize the fuel your employees burn on their commute. Maybe you can work out a four-day work week or stagger work hours. Perhaps your employees can take public transportation. Perhaps you can help them set up carpooling or create company-sponsored vanpools.

### Remaining cool

Insulation helps keep your building warm in the winter and cool in the summer. Another summertime energy-saver is an "economizer" air-conditioning system. The economizer controller senses indoor and outdoor air temperatures. When the outdoor air is cooler than the indoor air, the control automatically brings in outdoor air instead of continuing to cool the indoor air. In a temperate

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  - (3) Hydromat 16 Station 32-45-16 CNC Rotary Transfer Machines (2002)
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- (1) Micron Model MPC-600III, CNC Centerless Grinder (2002)
- Complete State of the Art Toolroom Equipment, Massive Quantities of CNC, Screw Machine and Perishable Tooling and Accessories
- Exceptional Quantities of State of the Art Q.C. and Inspection Equipment

#### (38) National Acme Gridley Multi Spindle Automatics (Rebuilt & Well Tooled)

- (3) NAG RAN6 1"; (16) NAG RB8 1 1/4"; (10) NAG RBN8 1 5/8"; (2) NAG RB8 2 5/8"; (6) NAG RBNC8 1 5/8"
- (2) Micron Multistar CNC Rotary Transfer Machines (2000)
- (2) National 750 7 Station 6 Die Cold Formers (Rebuilt by National 2005)

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**Above:** The HiTech Division of New Hampshire Ball Bearings.

climate, this can bring down energy usage during the summer.

### Seeing the light

Your building should have windows and skylights to provide natural light, but you'll need additional illumination, and it needs to be as energy-efficient as possible. Nowadays, compact fluorescents are the fixtures of choice. Install controls and occupancy sensors to turn the lights down when they're not needed.

In the recently constructed 11,000 square-foot heat-treating room at NHBB, the furnaces are painted a pale, putty color and the floor is finished with a bright white epoxy. These reflect the light so well that the 8-tube compact fluorescent light fixtures need to illuminate only six of the tubes. Lighting up all the tubes makes the room too bright, Carrier says. She will take that into account when planning new lighting in another area of the plant.

**Below:** Patti Carrier, environmental and facilities manager, in the heat-treat room at the HiTech division of New Hampshire Ball Bearing.




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### Efficiently keeping those spindles turning

Metal doesn't get cut unless there's a motor involved. All the motors in your green shop should be as efficient as possible to minimize electric usage. Premium-efficiency motors do exist, and, naturally, they are more expensive than conventional ones. But here's where you can make an ideal-world choice in the real world. "The D.O.E. (Department of Energy) will pay the difference between (the cost of) a normal motor and a high-efficiency motor," says Carrier (see sidebar).

### Cleaning up your act

You don't have to dispose of cutting fluids and cleaning solvents if you don't use them, so in your green shop try to limit their use. Wherever possible, plan your process around dry machining technology or one of the technologies that uses very small amounts of lubricant (see "How it Works" next month).

You will still need to clean parts, but in your green shop, the first choice for cleaning will be water-based (aqueous) cleaning; a wash, rinse and dry process. To minimize the amount of water you use and the amount of wastewater you generate, you will want to include a water recycling system. In one such system, the soapy, oily wash water goes through a membrane system to remove the oil, leaving soapy water. This passes through a nano-filter, and the resulting clean water is then re-used within the plant.



**Above:** Using recycled water in tumbling operation with bearing rings at the HiTech division of New Hampshire Ball Bearing.

## how it works

Sometimes water won't do the trick; but remember, solvents not only create waste disposal problems, they also evaporate and can cause your plant to exceed air pollution limits set by environmental agencies. If you do need solvent cleaning, you can minimize the waste and pollution concerns by installing a self-contained unit such as the Dürr Ecoclean system, available from Edge Technologies, Inc. Developed to comply with stringent European environmental codes, Ecoclean systems use isoparaffin, a non-chlorinated hydrocarbon, in a closed cycle to remove grease and debris from parts.

Batches of parts are loaded into a basket or rack and placed in the Ecoclean. The system immerses the parts and agitates them to clean and degrease them. The system then removes the parts from the fluid and pulls a vacuum to completely dry them. Finally, the system filters and distills the cleaning fluid, making it ready to reuse. In the process, it separates out the oil and particulates, which you will remove periodically. This type of system comes in different models suitable for different sizes of parts and the throughput capacity required. Each is housed in a large, rectangular enclosure and recycles the fluid in the same way.



**Above:** Removing oil: the first stage of water recycling at the HiTech division of New Hampshire Ball Bearing.

## Out with the bad acid, in with the good acid

In some cases, less toxic or hazardous materials can substitute for more hazardous ones. For example, in your new passivation line, you can use citric acid, a non-toxic substance used in food products, instead of the traditional nitric acid. After machining, iron remaining on the surface can rust. Passivation removes this free iron. Processes specifically designed for use with citric acid can cut cycle time, as well as save money on hazardous waste treatment and disposal. The citric acid passivation process at NHBB is approved for Defense Department components, and saves the company more than \$100,000 annually, compared to the previously used nitric acid process, Carrier says.

## Packaging

Your solid waste stream includes not only the masses of chips you produce, but also the boxes and other packaging you have to throw away. In a way, the packaging you use to ship the final product is also part of your waste stream, though your customer has to dispose of it. Look carefully at what your products really need for protection when inside your plant, when shipped between your plant and subcontractors and when sent to the final customer. Work with your suppliers and subcontractors to minimize wasteful packaging. For example, parts destined for the plating shop may be able to travel in the same plastic totes you use inside your plant.

## Waste not

Even the front office is fair game for greening. Be sure to select computers, copiers and other office equipment that carry the Energy Star rating. This equipment usually includes a low-power standby state and other energy-saving features.

Computer systems have the power to reduce the amount of paper used in your plant, but it takes some planning and sometimes development of customized software to make your processes truly paperless. Investigate systems that have worked for others (see "Assembly & Innovation," *TMW*, January 2006) and come up with your own, if necessary. Consider creating a purchasing policy that includes buying recycled paper and other products whenever possible. You can calculate the environmental impact of your paper choices at [www.papercalculator.org](http://www.papercalculator.org).

The environment. We all live in it, and so will our children and grandchildren. With planning, common sense and the latest technology, it's possible to build and run a successful machine shop while still respecting and caring for the world around us.

## For more information:

Your utility companies

[www.cee1.org](http://www.cee1.org) – Consortium for Energy Efficiency, including the Motor Systems Initiative

[www.edgetechnologies.com/durr-cleaning\\_systems/durr\\_cseries.htm](http://www.edgetechnologies.com/durr-cleaning_systems/durr_cseries.htm) – Dürr Ecoclean systems

[www.epa.gov/performance-track](http://www.epa.gov/performance-track) – Information about EPA's Performance Track program

[www.genesisonsite.com](http://www.genesisonsite.com) – Genesis On-site Recycling

[www.motoruponline.com](http://www.motoruponline.com) – Northeast program offering incentives for using premium efficiency motors

[www.neep.org/about/links.html](http://www.neep.org/about/links.html) – Links from Northeast Energy Efficiency Partnerships

[www.nhbb.com](http://www.nhbb.com) – New Hampshire Ball Bearings, Inc.

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# Make your own shop greener

Ideally, "green" is designed into the building and the process, but there are still plenty of ways you can make an existing shop more environmentally friendly. Many of the same energy saving strategies you use at home can work just as well at your place of business. You can often find rebates from your utility companies, and there are state and federal tax incentives for improvements you make.

## Saving electricity

They use less energy than conventional counterparts and last nearly forever. What are they? Compact fluorescent lights, of course. You may have them at home, but you should also consider installing them in the shop. Sizes and styles are available to replace a wide range of incandescent bulbs. Besides lowering your electric bill, the compact fluorescents generate less heat, so the plant stays cooler in the summer.

As you look to install new motors or replace motors, consider installing premium-efficiency models. Yes, they cost more, but regional programs, such as Motor Up, provide rebates to pay the difference in cost between a standard motor and its premium-efficiency counterpart. And you gain the savings on your electric bill – as much as \$300 per year running a 20-hp motor continuously at full load, according to Motor Up figures.

## Solving the solvents

A closed-cycle cleaning system may be beyond your means, but you can reduce the amount of mineral spirits you need to buy for degreasing, as well as reduce or eliminate disposal cost for waste solvent. A system like the Pro Clean Solvent Center from Genesis On-site Recycling in Gary, Indiana, distills dirty solvent, making it clean again so you can use it over and over.



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# how it works

## Where does all the heat go?

Most utility companies offer free or low-cost energy audits for businesses. You may think that your building is nice and tight and that your mechanical systems are working well, but it wouldn't hurt to have a professional evaluation of your building envelope and heating/cooling system. Take advantage of this service and make some of the high-priority improvements the audit recommends.

Making your shop greener can help you "do well by doing good." You'll be doing the right thing for the environment, and you'll save money at the same time.



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1 5/8" RB-6 1976-1952 threading-reaming-5 slides-conv-plex (5)  
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2- 5/8" RB-6 1976 - 1954 threading-reaming-5 slides-conv-plex  
2-5/8" RB-8 1974 & 1969 threading-3rd shelf-6thpocket-conv-plex  
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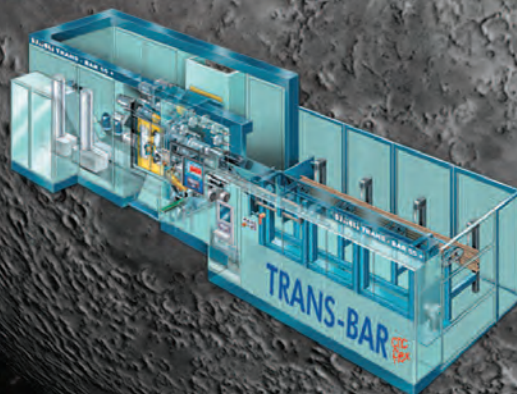
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# product focus

THE FOLLOWING ARE “MULTIPLE” COMPANIES WHO PROVIDED INFORMATION ON THEIR MULTI-SPINDLE MACHINES.

When you hear the term “multi-spindle,” the image you conjure up in your head is just that; a multi-tasking machine with multiple spindles that work in synchronization, allowing for the machine to multi-task on a part. With 4, 6 or 8-spindles, an automatic bar machine allows multiple tools to cut multiple workpieces simultaneously.

Due to its design, a multi-spindle machine creates parts quickly, because more than one cutting operation can be performed at a time. Because there are many variations of machining and multiple spindle heads, each spindle on a multi-spindle machine is intersected by two independent axes of tool movement.

Advances in design have allowed for easier set-up on multi-spindles, allowing for quicker changeover and quality execution. For high-volume, complex turned parts, multi-spindles have earned their place in today’s competitive manufacturing world.

## Index Corporation

The new INDEX MS22C is an affordable, fully CNC multi-spindle for production turning and milling of precision workpieces from bar up to 22mm (.86 in.) diameter. With six fully independent CNC spindles each capable of up to 10000 rpm, the machine provides full CNC capability and flexibility for production of precision parts in high volumes with very short setup times. A bar loader or stock reel can be used with the MS22.

Developed for the medium-complex workpiece market, the MS22C offers the speed of a cam machine with the flexibility of the CNC technology, shorter changeover times, and lower piece costs. The MS22C can pay for itself with lot sizes from 5000 parts for repeat orders. The machines use off-the-shelf, single-point tooling, avoiding the high cost of form tools.

The modular MS22C can be equipped with up to 62 axes, 12 CNC compound slides, Y axes, plus an optional two synchronous spindles and six tools for backworking, four of which may be live tools. In every spindle position, a C, X and Z axis is available. Backworking is also possible using three fixed tools. INDEX’s accessible open front work area allows more than one tool on each of the CNC compound (X, Y, Z) slides to be engaged at once.

For more information, please contact INDEX Corporation at 317-770-6300 or visit the company website at [www.index-usa.com](http://www.index-usa.com).





# product focus

## TPS International

Wirth & Gruffat ("WG") has designed a new rotary transfer platform called the Transturn, a cross between a CNC multi-spindle screw machine and a transfer machine.

Unlike transfer machines utilizing non-rotating, work holding collets, the work holding collets on the 6 or 12-station Transturn can rotate up to 6,000 rpm at each station. In addition, the collets can also rotate as a full C axis for radial operation capability. All collets are of quick-change, dual clamping pressure design and allow the user to easily switch to quick-change chucks for new applications without investing in a new index table. In conjunction with rotating spindles, each Transturn station provides a 2-axis upper slide and 2-axis lower slide. Each slide can accommodate static or driven tools.

Transturn is sold and serviced in North America by TPS International. For more information, please call 800-423-4031 or visit the company website at [www.tpsintl.com](http://www.tpsintl.com).



## Mikron Corporation

The new Mikron NRG-50 is designed for cylindrical and prismatic parts with an edge length of up to 2" (50mm) or alternatively 1.38" (35mm) diameter and 2.75" (70mm)

length. The customer has flexibility when initially acquiring this system or later on as new products are considered for production with the flexibility and magnitude of modular components available with standard interfaces. This modular machine comes equipped with simple drill, mill, turn or thread cutting units on all workstations. The Mikron NRG-50 extends the solution provider capability of Mikron Machining Technology to provide multi-axis, application developments in a single cycle machine. The flexibility of the machine, with up to 130 axes available under CNC control also provides greater freedom to component designers, enabling them to focus on function and performance rather than be hampered by a limited machining capability.

For more information, please contact Mikron Corp. 203-261-3100 or visit the company website at [www.mikron.com](http://www.mikron.com).





## Wickman

The Wickman 6-26 has been developed to meet the needs of the medium to large user looking for high productivity on a multi-spindle lathe. The latest generation of Wickman includes a Hirth-type drum locking for improved positioning accuracy; improved work spindle arrangement to allow spindle speed up to 5000 rpm; helical drive gears; toggle-free clamping; safety clutches fitted to the upper and lower camshaft, a Tetra Servo feed motor for optimum cycle times; and constant forward positioning on cross slides and upper cam shaft quadrants to optimize cutting strokes when using pre-set tooling. 6 cross slides, 2 independent slides in station 4 and 5, a stock carriage with acoustic cover and a removable swarf conveyor and coolant tank are all standard features on a Wickman 6-26. All accessories and attachments used on a 1" Wickman can be fitted on a Wickman 6-26.

For more information, please contact Graff-Pinkert & Company at 708-535-2200 or visit the company website at [www.graffpinkert.com](http://www.graffpinkert.com).

## Giuliani

The F-Cell is the latest machine in Giuliani's line. Designed to guarantee versatility for low and medium batch production of complex parts when high precision machining and high quality finishes are required.

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For more information, please contact Giuliani, a division of Bucci Industries, at 704-583-8341, or visit the company website at [www.giulianico.com](http://www.giulianico.com)



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# product focus

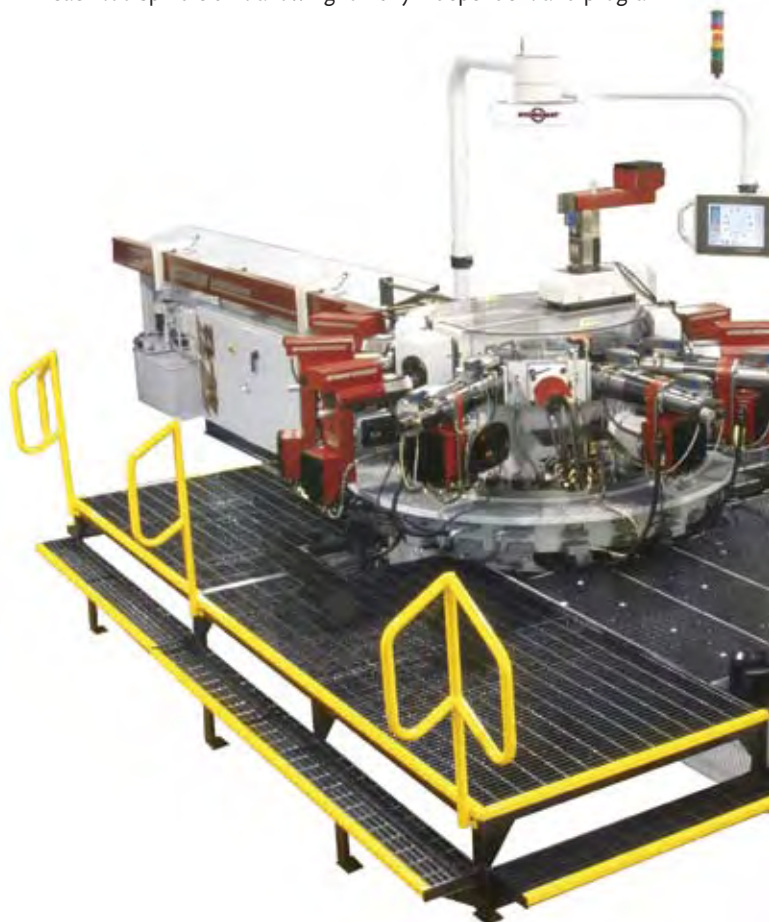
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## Hydromat

The Hydromat rotary transfer machines feature a modular system consisting of up to 16 horizontal and 8 vertical toolspindle units, rigidly mounted around a precision cast iron ring. The precision ground Hirth ring assures table accuracy and reliability from station-to-station to within .0002." Non-rotating bar stock ensures quiet, vibration free cutting operations. The EPIC R/T EMC Technology is featured on their latest machines. The EPIC R/T technology includes EMC, or Embedded Motion Control, which features special plug & play control architecture embedded into each toolspindle unit allowing for fully independent and program-



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Material cost/pc	\$0.08	\$0.08
Labor [\$ /hr]	\$60.00	\$60.00
S/U time [hr]	8	8
Parts per S/U	200,000	200,000
Cycle time [seconds]	6	6.00
#parts/year	800,000	800,000
<b>Cost/part</b>	<b>\$0.18240</b>	<b>\$0.18240</b>
Selling Price / part	\$0.26050	\$0.26050
<b>Total cost</b>	<b>\$145,920.00</b>	<b>\$145,920.00</b>
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Tornos multi-spindle by Hydromat represents a full line including; The MultiDECO 6 and 8 spindle, 20mm and 32mm bar-fed and 50mm chucker machines and the SAS 16.6 cam-operated lathe. The latest additions are two MultiAlpha units, a “ground-up” re-design featuring 32mm bar capacity with six spindles or the 25mm eight spindle version. Each spindle functions independently for cutting RPM, spindle stops and indexing. Each position can be used as a C axis, allowing transverse milling or drilling operations to be performed at any time on all spindles. Spindles can be synchronized in angular fashion, allowing eccentric drilling to be performed at several different stations. Advantages include: optimum speed on each position, unrivalled capacity for stock removal, great flexibility – C axis, “Transmit” function, stopping and exceptional spindle acceleration.



For more information on both Hydromat and Tornos multi-spindles, please contact Hydromat at 314-432-4644 or visit the company website at [www.hydromat.com](http://www.hydromat.com).

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# New!

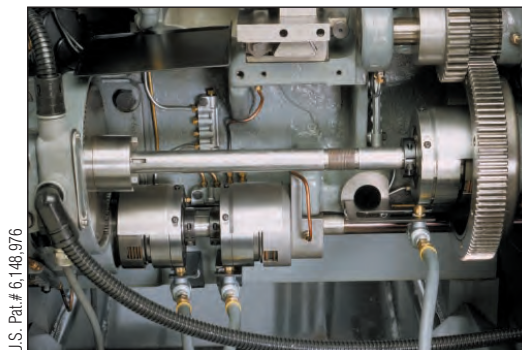
## Logan Hi-Lo Retrokits - NOW BETTER THAN EVER!

### Hi-Lo Retrokit Features:

- Replaces mechanical clutches, roll clutch, band brake and linkages with fast acting air-actuated Logan Clutches
- Positive crisp Logan Clutch engagement - Guarantees cycle time repeatability
- Simplifies clutch maintenance - No disc pack adjustment or slippage
- Quick Stop Power applied brake - Prevents machine coasting
- Ideal for bar loader applications

### Savings:

- Increase productivity from 10-20%
- Tools can be positioned closer to the work piece due to repeatable high and low speed clutch engagement
- Better machine utilization - More productivity from existing machines, operators and floor space

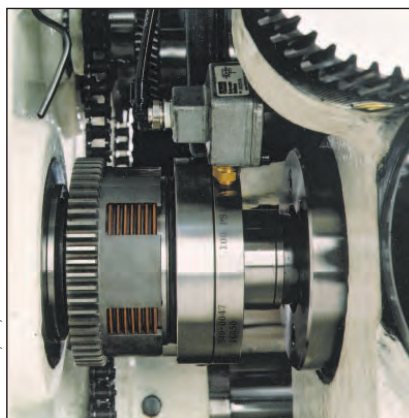


U.S. Pat. # 6,148,976

For Model B Davenports

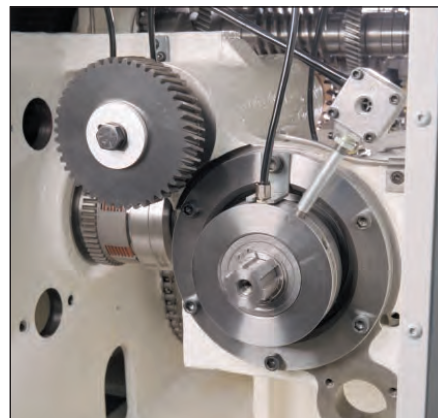


**New!** Roll Clutch Removal Option



U.S. Pat. # 6,050,162

For New Britains; High speed Conversion Kit - no slippage!



**New!** Roll Clutch Removal Feature

### So you think you need more production capacity?

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**Positive, fast acting Logan Clutch engagement allows your screw machine to change speeds much faster than conventional mechanical clutch methods**

**Reduce cycle time dramatically. Position tools closer to the work piece due to repeatable high and low speed clutch engagement.**



For Acme-Gridleys - Increase productivity 10%-20%

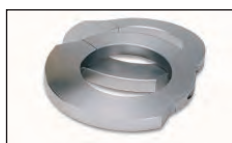
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### Hi-Lo Retrokits Controlled By:



1. Cams and Limit Switches



2. CS 2001XT8 or XT16 microprocessor control



3. CS 2001 microprocessor control

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# Spilling the Beans

I had to go out the back door to smoke at a customer's shop recently. There I found the shop's regular "smoking lounge," with a picnic table and butt can outside. When it's cold, people prop open the door and stand just inside it.

When I got there, the door was propped open with a bucket. After finishing my smoke, I slid the bucket out of the way to close the door and it tipped over, knocking the lid off and dumping a clear liquid over the grass and dirt. The label on the bucket said it was tricolor, a degreaser. I really didn't smell anything so I just set it upright and let the door close. I know about environmental concerns. A few years ago, my company had to spend huge amounts of money to excavate soil and monitor ground water after a fuel spill. Should I tell someone now? I don't think anyone saw me, and I don't even know if it was anything other than water.

## RUSSELL SAYS

The mother of all TV food chefs, the late Julia Childs, is reported to have remarked after an omelet slipped out of the pan during one of her live TV broadcasts, "Remember, you're in the kitchen and no one saw that." Fortunately, many of our awkward and clumsy moments go undetected, and we generally feel no obligation to subject ourselves to the embarrassment that disclosure might entail unless we have a need to "get it off our chest." The exception is when our acts create consequences to ourselves or others beyond our private embarrassment. You certainly would disclose to your doctor a serious injury you foolishly caused yourself. If your car was stuck partially off the road around a blind curve because you were driving too fast, you'd try to warn approaching drivers if you could do so safely. You'd also notify the stock clerk if you'd knocked a bottle of juice off a grocery store shelf so no one would slip on the mess. Why is this different? Perhaps it's the vast differences in the consequences of disclosure. If the bucket contained just water, no one would care about spilling it. If the bucket had something toxic in it, however, the EPA would investigate, lots of money would be involved, and your customer might face possible violations for poor

storage practices. But not disclosing could be worse. Maybe it was just water, but you'll only feel relieved if you know that. If it was a solvent, the hazard to ground water that feeds the subdivision nearby is substantial. Asking immediately about the bucket's contents might facilitate a rapid response that could prevent real harm and even greater costs. If you want to stay under the radar, ask someone in charge about the bucket's contents because you saw it empty on its side with the lid next to it (the truth but not the whole truth) and wondered about the label. You shouldn't take the blame if your clumsiness is revealed and the substance does turn out to be hazardous. Your customer is charged with the duty to handle these sorts of materials carefully, and using them as a door-stop doesn't qualify. By asking what was in the bucket and reporting its apparent spill, you will either be relieved to know no harm was done, or relieved to know that you reported something potentially dangerous.



TMW will explore business ethics monthly. Have an ethics question? email [jill@todaysmachiningworld.com](mailto:jill@todaysmachiningworld.com).



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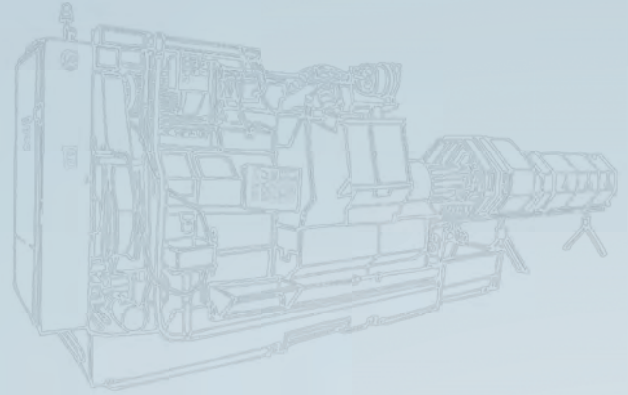
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1" 6-spindle, 1960-1992 (9)  
1-3/8" 6-spindle, 1967-1979 (3)  
1-3/4" 6-spindle, 1965, 1993 (7)  
1-3/4" 6-spindle, thdg., 1969  
1-3/4" 8-spindle, 1970  
2-1/4" 6-spindle, 1973-79 (3)  
3-1/4" 6-spindle, 1982  
5-5/8" 6-spindle, 1979  
6-5/8" 6-spindle, 1979

## ACMES

1" RAN6, 1975  
1-1/4" RA6, 1975 (3)  
1-1/4" RB8, 1975  
1-5/8" RB8, 1980, rebuilt 1996. pickoff  
1-5/8" RBN8, 1975, rebuilt 2002  
2" RB6, 1979-1985  
2-5/8" RB6-1977  
3-1/2" RB6, thdg  
6" RPA8, Gov't Storage

## GILDEMEISTER & SCHÜTTE

GM16 AC 1997 w/ lemca loader

SF51 6sp. Schütte, 1981  
AF26 8sp. Schütte, 1981 (2)

## SWISS-CNC SLIDING HEADSTOCK

Citizen L20, Type VII, 1996-98 (2)  
Citizen L25, Type VII, 1998  
Star 20mm, 1999  
Tsugami S25, 1993 w/ lemca loader

## NEW BRITAIN

Model 52, 1-1/4" 6sp., 1979 (3) pickoff  
Model 62 2-1/4" 6sp., 1975

## INDEX

MS 36E, 1993  
MS32B, 1995

## DAVENPORT

3/4" thdg., pickoff, 1985 (6) Tamer  
3/4" chucker, 1985 (4) Tamer  
3/4" thdg., pickoff, 1975

## CNC MACHINES / CNC LATHE

Nakamura Tome/Methods Slant 3B, 1987  
Bridgeport Interact 1 Mark 2 CNC Mill (2)

## CLEARANCE

Davenport cross drill 3rd and 4th  
Hydromat flanges for HW25-12  
30-60 Hydromat units \$5500 each  
Davenport chucking package \$2500  
Alps bar loader for CNC Swiss \$3950  
Magnetic chip cover for 2-1/4" Wickman,  
1-1/4" RA6 or 3/4" RA8 \$2950/each  
Davenport spindle stopping clutches \$35 each  
(only 75 left)  
Ring-type chucking package for 1-1.4"  
RA6 \$2500  
Mectron laser measuring machine mfd. 2000

## HYDROMATS

HW25-12 1986 (3)  
HB45-12 1997  
HB45-16 1994  
HS-16 2000  
HB45-16 chucker, 1997

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# shop doc

WITH NOAH GRAFF

*Today's Machining World's "Shop Doc" column taps into our vast contact base of machining experts to help you find solutions to your problems. We invite our readers to contribute suggestions and comments on the Shop Doc's advice. If you consider yourself a Shop Doc or know a potential Shop Doc, please let us know. You should also check out the TMW online forum at [www.todaysmachiningworld.com](http://www.todaysmachiningworld.com).*

**Have a technical issue you'd like addressed? Please email [noah@todaysmachiningworld.com](mailto:noah@todaysmachiningworld.com). We'll help solve your problem, then publish both the problem and solution in the next issue of the magazine.**

Dear Shop Doc,

We usually run our Brown & Sharpe machines at cycles less than 30 seconds. I was setting a stainless steel job at 120 seconds and my turret would double index at times. One of my co-workers said to grind some height off the trip dogs. The shop foreman saw me grinding on the trip dogs and hit the ceiling! He said to adjust the backshaft clutches instead. When I asked him what to do, he just said "adjust the screw." Which screw, what direction, how much? Help!

Signed, Tripping Along

Dear Tripping,

Your foreman is absolutely correct about not grinding on trip dogs. Never do that. All trip dogs should be at the same height.

When your backshaft clutch pocket and eccentric are in good shape and adjusted properly, the machine will not double index no matter what cycle time you are running.

The first thing to check is your eccentric screw (properly called the operating screw). If the edges are rounded or worn or the bottom of the screw is no longer flat, then replace it. They are cheap when compared to replacing the clutch. A worn screw will damage a good clutch pocket eventually. Examine this first.

Unfortunately, changing the operating screw will not solve your problem if your clutch pocket is overly worn. Look for wear in detent end. Test this by manually activating the clutch. If the pin drops back into the pocket, the clutch is worn and should be replaced. Again, keeping a good operating screw and proper adjustment will prevent premature clutch failure.

Adjusting the eccentric pin end of the operating

screw attains the proper clutch tooth spacing. Do not adjust the spacing by adjusting the abutment screw. This is a common mistake.

Adjusting the trip lever stop screw sets the proper depth of the operating screw. This adjustment prevents the operating screw from contacting the bottom surface of the clutch pocket when in the "disengaged" position. Confused yet? It's not that complicated. For complete instruction with diagrams on how to properly adjust your backshaft clutches go to [www.servocam.com/helpdesk/](http://www.servocam.com/helpdesk/). There you will find instructions for proper settings for both mechanical and air-actuated systems.

You will find the instructions on how to properly set your clutches to work with mechanical activation or air activation. The difference in the setting is noted in the instructions.

If you keep your operating screw in good condition and properly adjust your clutch assembly you will get years of continuous service from your machine without fighting index problems every time you change between a fast and slow cycle.

Happy Tripping,

**Greg Knight**  
Vice President, AMT Machine Systems



## Taurus and the Ford Junkyard

It entered the world with the proverbial bang. But when the last Ford Taurus sedans rolled off the Atlanta assembly line in October, it was accompanied by little more than a whimper from thousands of workers losing their jobs.

The original 1986 Taurus saved Ford, which was in even worse shape then than it is now. Boasting a variety of innovative features, complimented by its trend-setting “jellybean” design, Taurus raced to the top of the U.S. sales charts, struggling to meet demand with two assembly plants running double shifts. It was, in fact, the last American product to top the passenger car list, now dominated by import sedans such as the Toyota Camry and Honda Accord.

While those Japanese nameplates remain perennial favorites, Taurus has, in recent years, survived only as a fleet car, dumped into daily rental duty or sold on the cheap to deal-focused corporate customers.

How could the mighty fall? One might ask that about an array of once-popular Ford products. Remember the Fairlane, Galaxy and Escort? Indeed, Escort’s replacement in the small car stratum, the Focus, has also seen its star dim, providing a metaphor for a lot that has gone wrong, not only at Ford, but the domestic auto industry overall.

The number two American automaker has shown a disconcerting tendency to launch exciting new products and then seemingly lose interest. By the time the plug was pulled on Taurus, the once-breakthrough sedan had evolved into a lackluster four-door woefully behind its competition in terms of design and technology. Focus has suffered the same cruel fate. While the automaker rolled out a dramatically improved version in Europe several years ago, we American motorists are being offered the same, tired subcompact Ford first rolled into U.S. showrooms in 1998.

In today’s competitive market, where buyers can choose from a record number of offerings, Ford’s *laissez faire* strategy helps explain its steadily dwindling market share and record losses. The automaker insists it is developing some “Bold Moves,” but it’s moving too slowly.

Okay, I expect a couple nasty phone calls or e-mails from the public relations department. They’ll rightly point to hot vehicles like the Fusion sedan and Lincoln Zephyr. These are both solid cars deserving kudos, but Zephyr typifies another plague which Ford – and its cross-town rivals – have brought upon their own houses. Lincoln’s entry-level sedan has received solid reviews since it debuted a year ago. So why is Ford eliminating the nameplate, especially after investing tens of millions of dollars on marketing the Zephyr badge? Actually, the car itself isn’t going away. It’s just being rechristened MKZ.

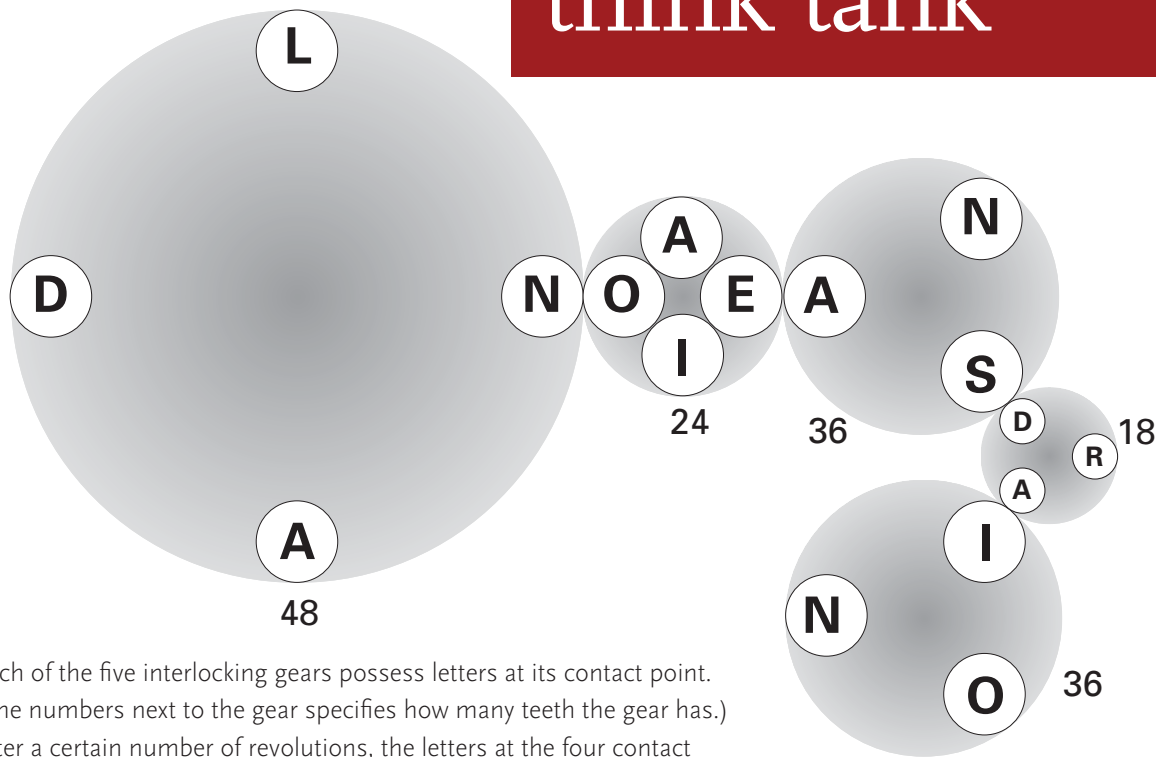
That, in itself, is one of the oddest branding strategies I’ve seen in three decades covering the auto industry. All new Lincolns – but, for some reason, not the Navigator – will get three-letter names. The MKX is a new crossover/utility, and a new flagship sedan will be dubbed MKS. Senior planners thought this would harken back to the legendary Lincoln Marks – such as the Continental Mark II – but in customer clinics, no one seems to get it. Potential customers call the renamed Zephyr the “Em-Kay-Zee,” not “Mark-Zee,” as Ford planned. Whoops.

Now, as I noted earlier, Ford hasn’t sinned alone. Among the Big Three, barely a half-dozen passenger car nameplates have been around continuously for at least two decades. None at Chrysler, a couple at General Motors, and only a few, including the Mustang and Crown Victoria at Ford. With rare exception, however, it takes a real disaster for Japanese makers to abandon brand names. So, year after year, Accord and Camry continue to build brand awareness and momentum, something worth millions in free, word-of-mouth marketing.

That loops back to Taurus. If you can’t keep a product current, it doesn’t matter what you call it. The Taurus brand name was demolished by neglect, and Ford is paying the price for letting a once-great product fade away.



## Gear Anagram



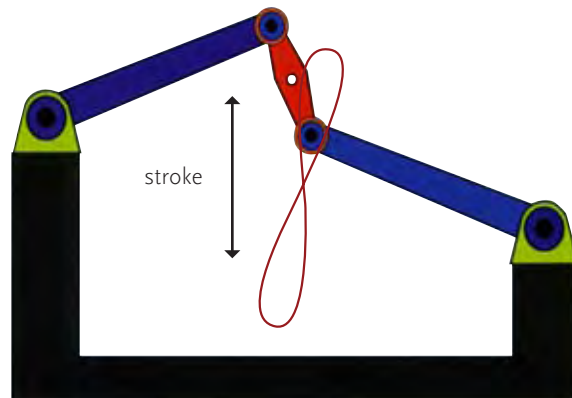
Each of the five interlocking gears possess letters at its contact point.  
(The numbers next to the gear specifies how many teeth the gear has.)  
After a certain number of revolutions, the letters at the four contact points will spell out an eight-letter word, read from left to right.

Can you make out how many revolutions it will take and what the secret word is?

Send in your answer—quick! Fax Jill at 708-535-0103, or email at [jill@todaysmachiningworld.com](mailto:jill@todaysmachiningworld.com)

## Watts Linkage

The linkage illustrated is a schematic representation of the famous Watt's Linkage, which draws a figure-eight shaped curve. Part of that curve – called Bernoulli's lemniscates – is nearly a straight line.



## Who got it straight?

**Wayne Wilson** from DeSoto Engineering in Blair, NE; **Stephen Ivey** of Rheem Manufacturing Company in Milledgeville, GA; **Dennis Holby** of Accu-Mold in Latrobe, PA; **John M. Weber** of Weber Systems, Inc. in Menomonee Falls, WI; **Uli Kuster** of Blaser Swisslube in Rohnert Park, CA; **Dick Boldt** of E & A Manufacturing in Dundee, MI; **Roger Stillman** of Metric & Multistandard in Hawthorne, NY; **Al McBride** of Threading 101 in Menomonee Falls, WI; **Jim Brown** of Apogee Machining Services, Inc. in Salem, MA; **Miles Free** of PMPA in Brecksville, OH; **Ron May** of Hunter Engineering Company in Bridgeton, MO; **Steven Gredell** of Empire Machine Works in Raytown, MO; **Jared Crawford** 10th grade student at Wilson High School, Long Beach, CA; **David Kudija** of California Standoff in Paso Robles, CA; **Dave Koepper** of Shur-Lok Corporation in Irvine, CA; **Richard Archer** of DMG Canada in Mississauga, Ontario Canada and **Steve Sutton** of Craft Precision in Schoolcraft, MI.

# postings



Noteable and newsworthy information and events for the month of February.

## MDM West

Medical Design & Manufacturing

Exposition/Conference

February 12-15<sup>th</sup>  
Anaheim, CA

[www.deviceink.com/expo/west07](http://www.deviceink.com/expo/west07)

February 12 thru 15

Anaheim, CA

Pacific Design & Manufacturing

[www.deviceink.com/expo/pac07](http://www.deviceink.com/expo/pac07)

## Auction

Manufacturing Machinery Exchange (MMX) #17

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[www.dovebid.com](http://www.dovebid.com)

Worldwide

Feb 15,  
9:00 AM PST  
Feb 16,  
11:00 AM PST

## Lean Outsourcing Seminar

Profiting from Global Operations  
San Jose, CA

February 15 & 16

[www.ventureoutsource.com](http://www.ventureoutsource.com)

Making Lean Work for the Job Shop and Small Manufacturer

Anaheim, CA

February 6 - 7

[www.sme.org](http://www.sme.org)

## MDT

Medical Device Technology Exhibition & Conference

Birmingham UK

February 14-15<sup>th</sup>

[www.deviceink.com/expo/mdt2007](http://www.deviceink.com/expo/mdt2007)

## Super Bowl XLII

February 4<sup>th</sup>  
[www.superbowl.com](http://www.superbowl.com)

Alka Seltzer introduced February 21, 1931

[www.butlerwebs.com](http://www.butlerwebs.com)

Clean Out Your Computer Day



Feb 13<sup>th</sup>

[www.organized-living.com](http://www.organized-living.com)

HAPPY BIRTHDAY

## Galileo

February 4<sup>th</sup> 1564

[www.wikipedia.org](http://www.wikipedia.org)



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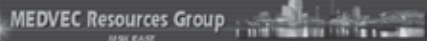
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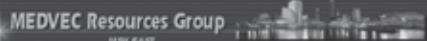
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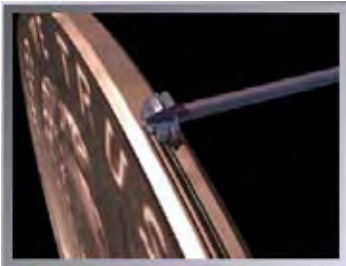
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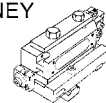
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# afterthought

## Go Green

I used to think of “green” as the color of the Michigan State Spartans and that grassy area I never reached in two when I was golfing. But now I think that both politically and economically I have to take the “green,” or environmentally sensitive view, seriously.

If you look around you see Jeffrey Immelt, the head of General Electric, funneling money into windmills. He is tilting the world’s biggest industrial concern toward the Greens.

Al Gore may have acted dumb in 2000, but he is fashioning a shrewd political comeback around his skillful movie polemic *An Inconvenient Truth*. He could ride global warming to the Democratic presidential nomination in 2008 if Hillary implodes and he finds a good acting coach.

“ Green is intersecting the business and political mainstream in America. ”

In California, Republican Arnold Schwarzenegger has vetted his political smarts by hopping on the green wave in a major shift. In a Democratic state, he won a landslide victory in 2006 for Governor by showing you don’t have to be a “girly-man” to be kosher environmentally.

This move means something. Green is intersecting the business and political mainstream in America. Another significant reason that green is gaining traction even in the conservative elites is the realization that oil imports to the U.S. are killing our balance of payments, which means a weak dollar, which translates into more inflation and higher interest rates.

And from a security standpoint, Iran, in a few years, could detonate a nuclear device in the Straits of Hormuz and starve the world of oil from one Ramadan to the next to show the might of the Shia Muslim nation.

So viva photovoltaics. Stan Ovshinsky at Energy Conversion Devices in Auburn Hills, Michigan is now making money on flexible photovoltaic (PV) sheets of football field length.

Toyota will probably have a commercial plug-in hybrid on the market in 2008, which will be the real breakthrough in gas mileage we’ve been yearning for. General Motors, after killing their advanced electric car prototype for the illusionary dream of a fuel cell hydrogen car, now says they will have a Saturn plug-in hybrid next year. For many people like me who drive less than 50 miles per day, the plug-in rechargeable will virtually liberate us from the BP station.

I read a well-researched report from the respected Wall Street money manager, Sanford Bernstein, which predicts a dramatic drop in oil consumption after 2015 and a big price drop for the commodity. If you are in business you want to be on the winning side in the oil tug of war. I would bet on clean coal and solar, not oil.

A huge amount of venture capital money is pouring into making coal environmentally palatable. For plug-in cars to work you need electricity at reasonable rates – i.e., coal or nuclear. You won’t need that many more generating plants because solar and wind will be pumping during the day and coal-fired plants will be working at greater capacity in the evening. But coal has to be “clean” to satisfy the increasingly powerful Greens. This means turning it into natural gas or scrubbing it, which produces unwanted carbon dioxide. A lot of the venture capital dough is aimed at the CO<sub>2</sub> problem. Solve that one and the Saudis will be pounding salt in a few years.

Go Green.

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