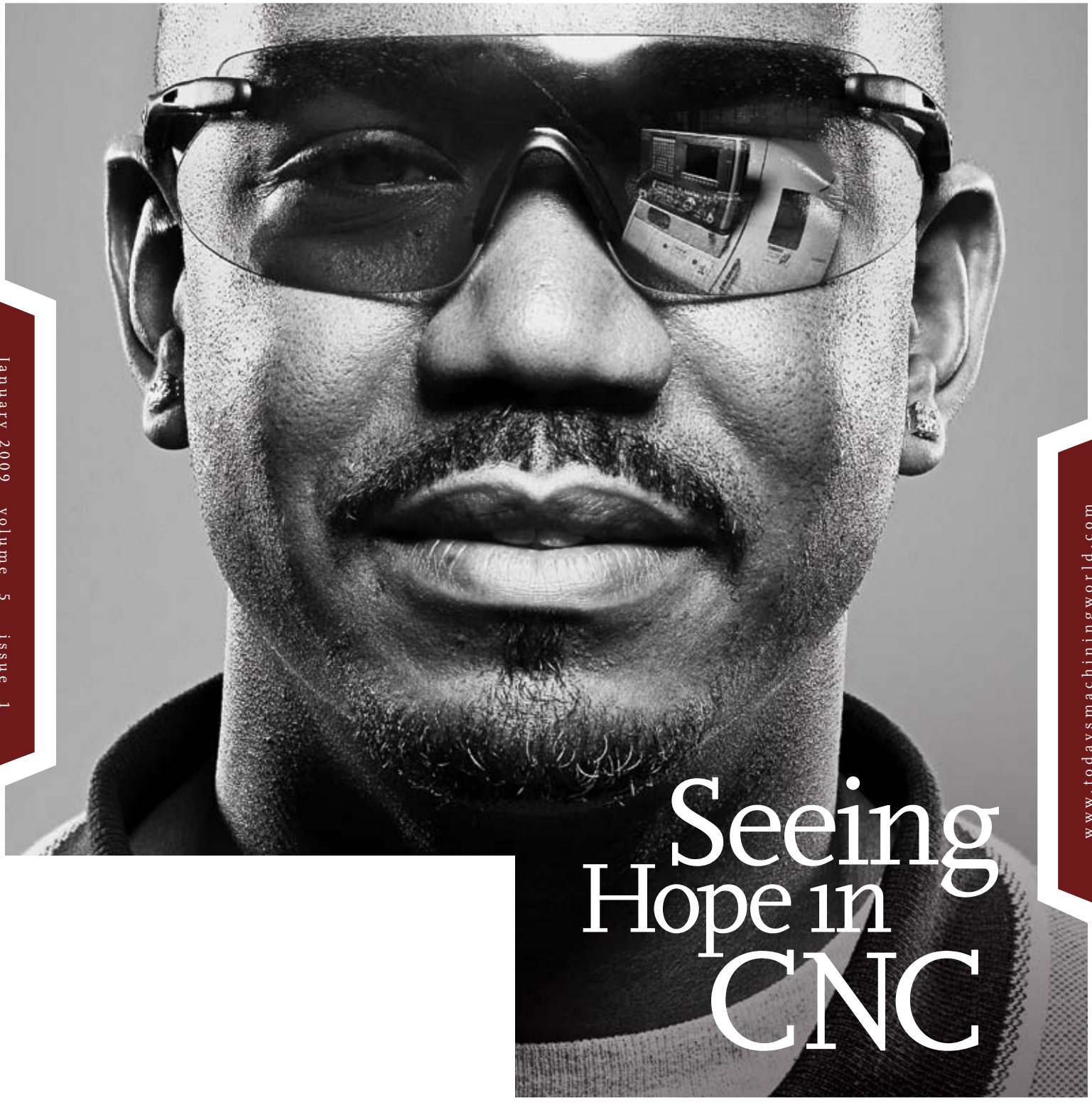
John Tumazos

Bar Loaders

Inside China

Today's Machining World

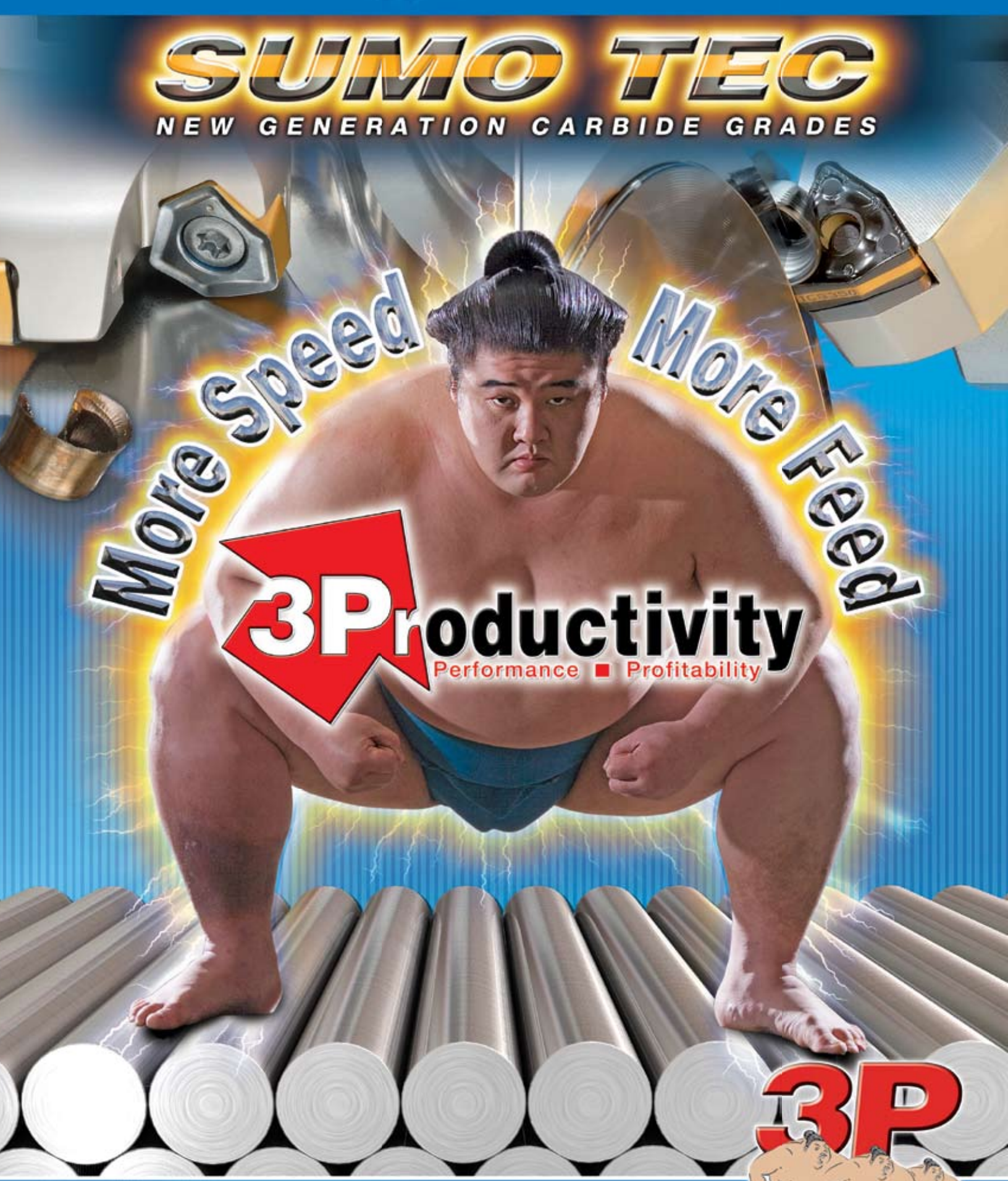
THE MAGAZINE FOR THE PRECISION PARTS INDUSTRY



Seeing Hope in CNC

January 2009 volume 5 issue 1

www.todaysmachiningworld.com



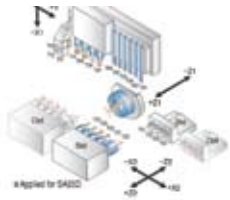
Member IMC Group

ISCAR METALS INC. 300 Westway Place, Arlington,
TX 76018-1021 Tel+1 817 258 3200,
Fax+1 817 258 3221,Tech Tel 1-877-BY-ISCAR
info@iscarmetals.com, www.iscarmetals.com

NEXTURN
SWISS TURN LEADER

"HEAVY METAL"

has a new definition



SA20D Tool Layout

Oil Cooled Built-in Motors

Before you buy your next CNC Swiss you owe it to your customers - and to your business - to compare the newest generation of Nexturn CNC Swiss-Type Lathes to the competition. A powerful 10 HP Main Spindle Motor and a 5 HP Sub-Spindle Motor are standard on the SA26D & SA32D Models. This includes a 1½ HP Mill/Drill Unit on the gang with a cross spindle speed of 8,000 RPM's. Equipped with 20 tools, 8 of them live. Amazing!

There are many standard features on a Nexturn Machine that are paid options on some competitive machines, such as a Oil Cooled Main/Sub-Spindles, Parts Conveyor, Patrol Light, Full Contouring C-Axis Main/Sub-Spindle, and Synchronous RGB just to name a few. The machines are controlled by the reliable FANUC 18i-TB 7-Axis CNC Control. All for thousands of dollars less than comparable equipment.

The full line of Nexturn Models range from 12mm to 45mm in bar diameters. All Nexturn Machines come with a two-year parts warranty.

This time-choose NEXTURN!

Back End Tool Station

5-hp Sub-Spindle

Turn-Key applications are welcomed!

TMT Swiss

603-474-7692 www.nexturnswiss.com

The Parts You Need When You Need Them

The Service You Expect

AUTHORIZED DISTRIBUTORS

- Accu Trak Tool Corp.
- B&S Screw Machine Services
- Boyar Schultz (LDE)
- DT Tool Holders (Carb insert)
- Davenport
- M & M Mfg. Co.
- Quality Chaser Co.
- Schlitter Tool
- R.L. Spellman Co.
- Hardinge

IN STOCK AND READY TO SHIP

B&S spindle assemblies • B&S #2 & #00 windows, doors & rails • bearings • belting • cam blanks • cams for multi spindles • carbide inserted box tools • chains • chasers • chip carts for B&S and Acme • chip conveyors • collets, new or used • collet tubes • cut off blades • cutting oil screens • deflector cables • die heads • die head yokes • drill bushings • gaskets • gears • knurls • lipe pusher assemblies • pads • pulleys • pumps • pushers, new and used • pusher tubes • rebuilt dynabrake motors with digital timer • schematic prints • Servo Cam units • shafts • silent stock tubes • spindles • tap bushings • timing cams • tool holders for single and multi spindles • tubing • vibra check machine mounting pads • plus some wickman stuff

AMSCO

AUTO-MATIC SCREW MACHINE TOOL & SUPPLY CO.

Ask for Pat Pagac or Wendell Rogers

6775 Brandt Rd., Romulus, MI 48174
800/832-6726 • 734/728-8500 • FAX 734/728-8020
Visit our Website: www.autoscrewamsco.com E-Mail: office@autoscrewamsco.com

AMSCO

Over 50 Years of Satisfying Customers

in this issue

Today's Machining World
January 2009 volume 5 issue 1

Features

22 The Manufacturing Training Alliance
Training hard-to-place workers as CNC machine operators *by Emily Halgrimson*

29 Has Scrap Become Junk?
Lloyd and Noah Graff interview steel expert John Tumazos

42 How it Works
Micro-machining by Barbara Donohue

Departments

7 Editor's Note

11 Forum

13 Swarf

18 Book Review
Excellence Without a Soul
By Jerry Levine

19 Fresh Stuff

37 Shop Doc

38 Next

40 One on One

48 China

50 Product Focus
Bar Loaders

54 Think Tank

55 Postings

62 Afterthought
TMW's *Report Card*

57 Ad Index

58 Classifieds

in this issue

Cover and TOC photo by David Torrence Photography, St. Louis, MO.

SUBSCRIPTION/CHANGE OF ADDRESS: Basic subscription rate: US$40 for domestic/US$55 for international.

Send address changes and/or subscription inquiries to: Today's Machining World, P.O. Box 847, Lowell, MA 01853 or email cs-smw@computerfulfillment.com

CPC Publication Agreement Number 40048288

Canadian Return Address: World Distribution Services, Station A, P.O. Box 54, Windsor, ON N9A 6J5 email: cpcreturns@wdsmail.com

Today's Machining World (USPS 024-909) (ISSN 1945-4643) is published monthly, 12 times a year by Screw Machine World, Inc., 4235 w 166th Street, Oak Forest, Ill. 60452.

POSTMASTER: Send address changes to Today's Machining World, PO Box 847, Lowell MA 01853.

Subscribers may also e-mail address changes to cs-smw@computerfulfillment.com

Periodical postage paid at Oak Forest, IL and additional mailing offices.

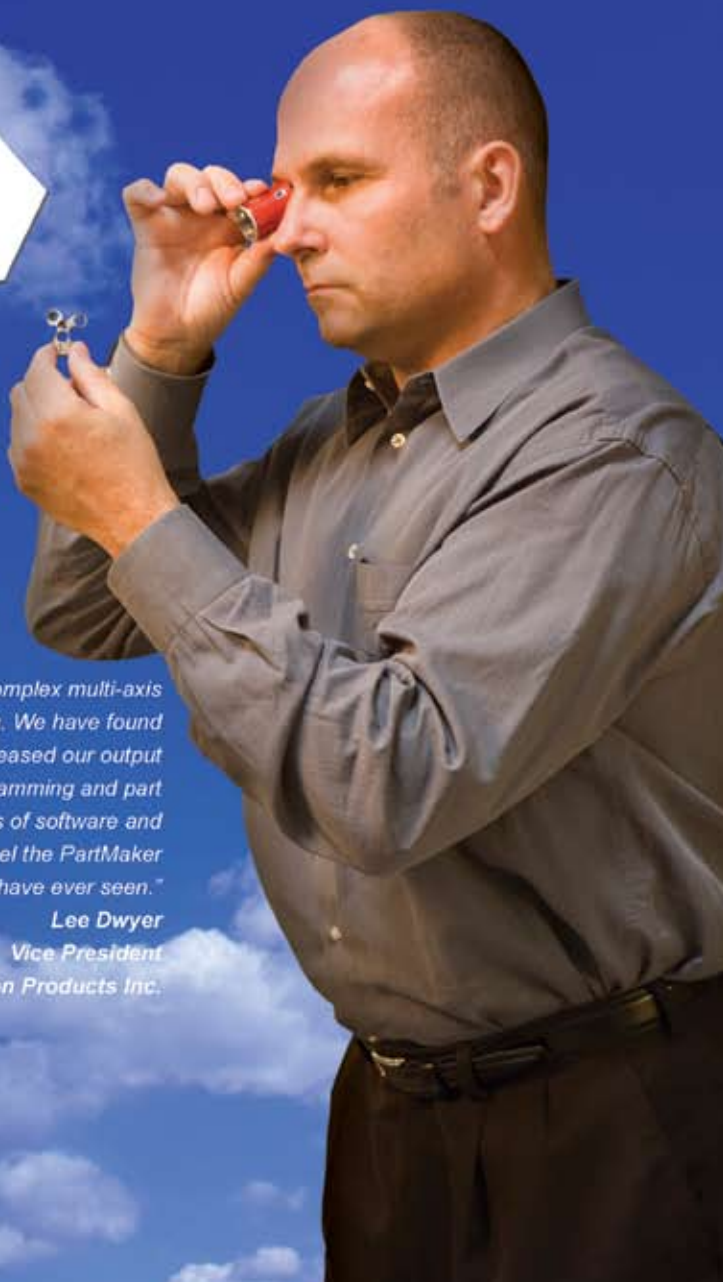
CPC Publication Agreement Number 40048288

Canadian Return Address: World Distribution Service , Station A PO Box 54, Windsor, ON N9A 6J5 or email: cpcreturns@wdsmail.com

BPA WORLDWIDE

Delcam

Are you looking for a way to reduce programming and set-up time on your Turn-Mills and Swiss-type lathes?



"Starro Precision specializes in complex multi-axis turning, Swiss turning and milling. We have found PartMaker to be a saviour and increased our output by 300% regarding programming and part qualification. With over 20 years of software and CAD/CAM experience, we feel the PartMaker is the best we have ever seen."

Lee Dwyer
Vice President
Starro Precision Products Inc.

Find out how Delcam can help you.

See us at IMTS http://www.delcam.com/imts/
or call **1 888 270 6878**
For more information on ParkMaker visit
www.PartMaker.com

Today's Machining World

www.todaysmachiningworld.com

A Screw Machine World Inc. Publication
4235 W. 166th Street
Oak Forest, IL 60452
(708) 535-2200

Family Ties

I have had the privilege of working with my son, Noah, for four years now. I have seen him grow as a writer, editor and videographer without much input from me, as I've been juggling my writing, business interests and health issues.

Somehow Noah has managed to put up with me, and I now consider him my "go to" person for new ideas, as well as my best friend and occasional driver. When I was about to be wheeled into the operating room for quadruple bypass surgery, I paused to write a note that I wanted *Today's Machining World* to go to Noah if I did not make it through.

TMW has addressed family business issues many times. I believe running a business for a long time through thick and thin is extremely tough. Dealing with the overlay of family rivalries and tensions complicating the continuous trials of competition and technology shifts makes long-term family business success almost impossible. Add the confiscatory estate tax to the mix as another hurdle.

The Graffs have managed four generations of family business somehow. I sometimes wonder how I ever worked with my Dad for 25 years. His moods confounded me, and I struggled mightily for his authentic praise. We had conflicting views about strategy and risk, but I think we hung in together because we loved each other and respected each other so much.

I don't know if Noah is in it for the long haul. He longs to prove himself as a creative force, and I know that his interest in the machining world is a cultivated taste. I hope we have a very long run for my selfish reasons — but whatever happens, these past four years together have been great for me.

Lloyd Graff
Editor/Owner

Today's Machining World

January's talent pool

contributors

Lloyd Graff has worked at Graff-Pinkert and Co, a machine tool trading firm, for 47 years, starting at 17 as a telephone prospector. He started *Screw Machine World* in 1999 which morphed into *Today's Machining World* in 2005. His writing career began at age 12 with a letter to the editor published by the *Chicago Daily News*. At that point he considered good writing to be the correct use of big words like "evanescence." His favorite sport is table tennis. If he could only have one food on a desert island it would be a Crisco pie crust.

Tom Clouse is a freelance writer who has been living in China since 2002. He writes about a number of Asia-related topics including economics, finance, travel, music, and nightlife. A native of Tennessee, he likes hiking, drinking moonshine and eating bacon. Drama is another interest, and Tom hopes to one day appear in cheesy karaoke videos around the world.

Emily Halgrimson, Managing Editor of *Today's Machining World* graduated from the Eastman School of Music with a degree in French horn performance. She then spent a year volunteering at a Bangladeshi orphanage, spent three years at the Rochester Zen Center, and most recently — did a stint in the Peace Corps in Benin, West Africa. Her recent road trip down to St. Louis, Missouri, to interview the people of the Manufacturing Training Alliance left her feeling pumped up and inspired. The prospect of putting that plethora of information together cohesively on paper, did not.

Robert Bocok *TMW's* new Creative Director, attended Missouri State and has been working in graphic design for 14 years. He started his own graphic design agency, Top Creative Group, in 2001. Rob is a drummer and enjoys different aspects of music — so much, in fact, that he has built his own drum set. He has an extensive knowledge of cars and dreams of someday living in New Zealand. Rob's vast experience in publishing brings an experienced voice to the *TMW* team and his positive energy keeps the workplace fun and productive.

Presenting the largest product introduction in Hurco's 40 year history.

40 YEARS

NEW WinMax® software features
5-axis process efficiency.
Tool change optimization.
Graphical cross-sectioning.
…and more.

NEW Large machines for aerospace and energy patch
DCX22 Dual column machine.
VTXZ Zone machine.

NEW 5-axis machines and technology
U Series with integrated trunnion table.
SR Series with swivel-head compact design.

NEW High performance lathes
TMX Series built for power.

NEW Multi-tasking machines
TMX with sub-spindle and bonus Y-axis.
Lathes with live tooling.

NEW Hurco Online Tooling service
The quality you need.
The convenience you deserve.

NEW Extended Shop Floor technology
The freedom and productivity of 24/7 machining.

HURCO®
IN CONTROL

www.hurco.com 800.634.2416

Machines shown with options. Prices and information may change without notice.

PMTS 2009

PRECISION MACHINING TECHNOLOGY SHOW

Moving Precision Machining Into The Future

APRIL 28-30, 2009

REGISTRATION IS **FREE** FOR PRE-REGISTERED ATTENDEES

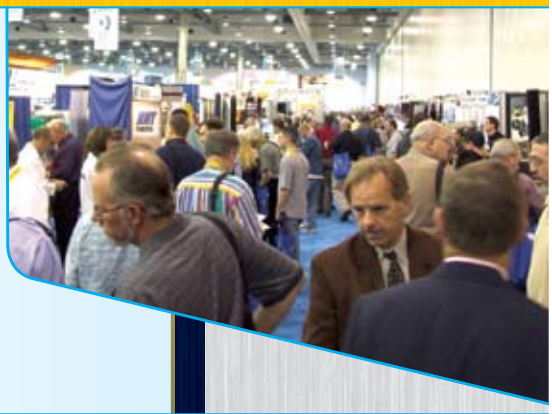
REGISTER TODAY AT **pmts.com**

Greater Columbus Convention Center
Columbus, OH USA

SEE

More than 200 exhibiting companies will be displaying these and other products and services:

- Swiss CNC Machines
- Lathes and CNC Turning Centers
- Rotary Transfer Machines
- Cutting Tools, Holders and Attachments
- Automatic Screw Machines
- Support Machinery
- Wire EDM Equipment
- Secondary Operations Machines
- Accessories and Auxiliary Equipment
- Grinding Machines
- Raw Materials
- Metrology Equipment
- Computer Hardware and Software
- Quality Management Systems



LEARN

Attend FREE educational sessions conducted by industry experts covering topics effecting people involved with precision machining:

- Hard Turning
- Oil Cost Control
- Thread Milling Workshop
- Green & Green Success
- Innovations in Problem Solving

FEEL

As a PMTS attendee, you'll have the unique opportunity to see hands-on demonstrations on the show floor. See these companies demonstrating real machines in action!

- Index Corporation
- Tsugami Corporation
- Davenport Machine Company
- Hydromat Incorporated
- Hardinge Incorporated
- Marubeni Citizen-Cincom Incorporated
- AMT Machine Systems Ltd.

Presented by

PMPA
Precision Machined Products Association

Co-Presented by

Production Machining

Modern Machine Shop

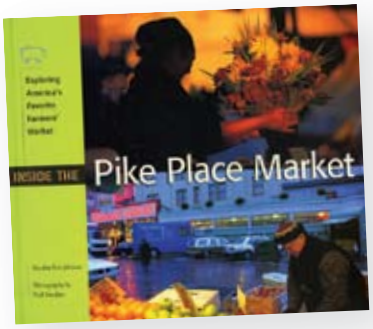
For more information about the show call 800-950-8020 or visit www.pmts.com.

Now is the time

I have been wanting to drop Lloyd a note to say how much I enjoy the magazine but there always seems to be something more pressing. But when I read that he had been in the hospital and was recovering from heart surgery I realized that procrastinating is a mistake, especially when it comes to people. So I wish him a speedy and complete recovery. As for the magazine, please keep up the good work. I always enjoy the interviews and Lloyd's views on the economy as it relates to the machine and manufacturing industry.

Lawrence P. Poppert, Jr.
Poppert's Gunsmithing
Glenside, PA

Reality Check



Until I read of Lloyd's health scare in the most recent issue, I had no idea what had happened, or as he described so vividly, how close he came to dying. Man, what a much-needed reality check he gave all of us other guys in our 50s! My wife and I love Farmers markets, too, and really got turned on to the Evanston one this summer. Here, to assist in his recuperation, is a book on what reportedly is one of his all-time favorite Farmers markets. Enjoy and keep getting better.

Gary L. Slack
Chairman and Chief Experience Officer
Slack Barshinger

Good job, and good luck

Thanks for the inclusion of my old truck in your magazine. I didn't expect the Power Wagon to show up so quickly. I thought magazines had longer lead times. In spite of the rusty truck article, I think your publication is the best manufacturing trade magazine out there. The high literary content is totally unexpected in this genre. Keep up the great work! You all did an amazing job publishing the magazine while Lloyd was "out sick". I did miss his "flavor," especially his take on business in this country, and enjoy reading his views and opinions again. I wish him the best in his continued recovery, and many more years of writing, something he obviously enjoys so much and does so well.

PS The changing "cast" pictures at the beginning of the magazine is a nice touch showing the many sides of you folks.

Dave Dribble
Electro Form Corp,
Binghamton, NY.

A TMW *Swarfblog entry on Nov. 19, asked whether declaring bankruptcy was the worst course of action for General Motors. Below is one response.*

Better for all

While I'm very tempted to say let the chips fall where they may to the Big Three, it's painfully obvious that the rest of the U.S. would suffer greatly for their bad management decisions. It's really a conundrum. If other areas of our economy weren't in such bad shape, we could probably weather the storm. But then again, the Big Three are partially in trouble because of this meltdown. Who comes first, the chicken or the egg? At the moment I'm leaning toward a very structured bailout with lots of rules and regulations, and above all, a congressional oversight committee that has power over all executive decisions.

Elizabeth Barr
Advanced Machine & Fabrication, Inc.
Author of the blog "The Machinist's Wife"

Something on your mind? We'd love to hear it.

Send your comments to: *TMW Magazine* 4235 W. 166th Street, Oak Forest, IL 60452

Or email us at: emily@todaysmachiningworld.com or lloyd@todaysmachiningworld.com

Champion Screw Machine Engineering, Inc.

Established in 1945

New 570 pg Reference Manual
Request Your Copy Today
sales@championscrew.com

Serving You Better

For 63 years it has been our goal to support the metal turning industry. Our dedication to improving that support is stronger than ever.

Our new Acme-Gridley Technical Reference Manual is the result of four years of development. It is a powerful new tool that is now available to the industry.

We have also recently opened our newest machine rebuild and re-condition facility in Sandusky, Michigan. It is staffed by some of the most skilled and diversified technicians available in the industry today.

When you need support, give Champion a call.

Replacement Parts, Tooling, Attachments & Accessories

Champion Screw Machine Services, Inc.

Established in 1994

A subsidiary of Champion Screw Machine Engineering, Inc.

2 Locations to serve you

Wixom, MI

Sandusky, MI

Rebuilding, Reconditioning, Carrier Rebuilding, Machine Repairs,
Field Service, Process Engineering & Machinery Sales

Just call CHAMPION
(800) 727-2763

www.championscrew.com

By Lloyd Graff

A Different Approach

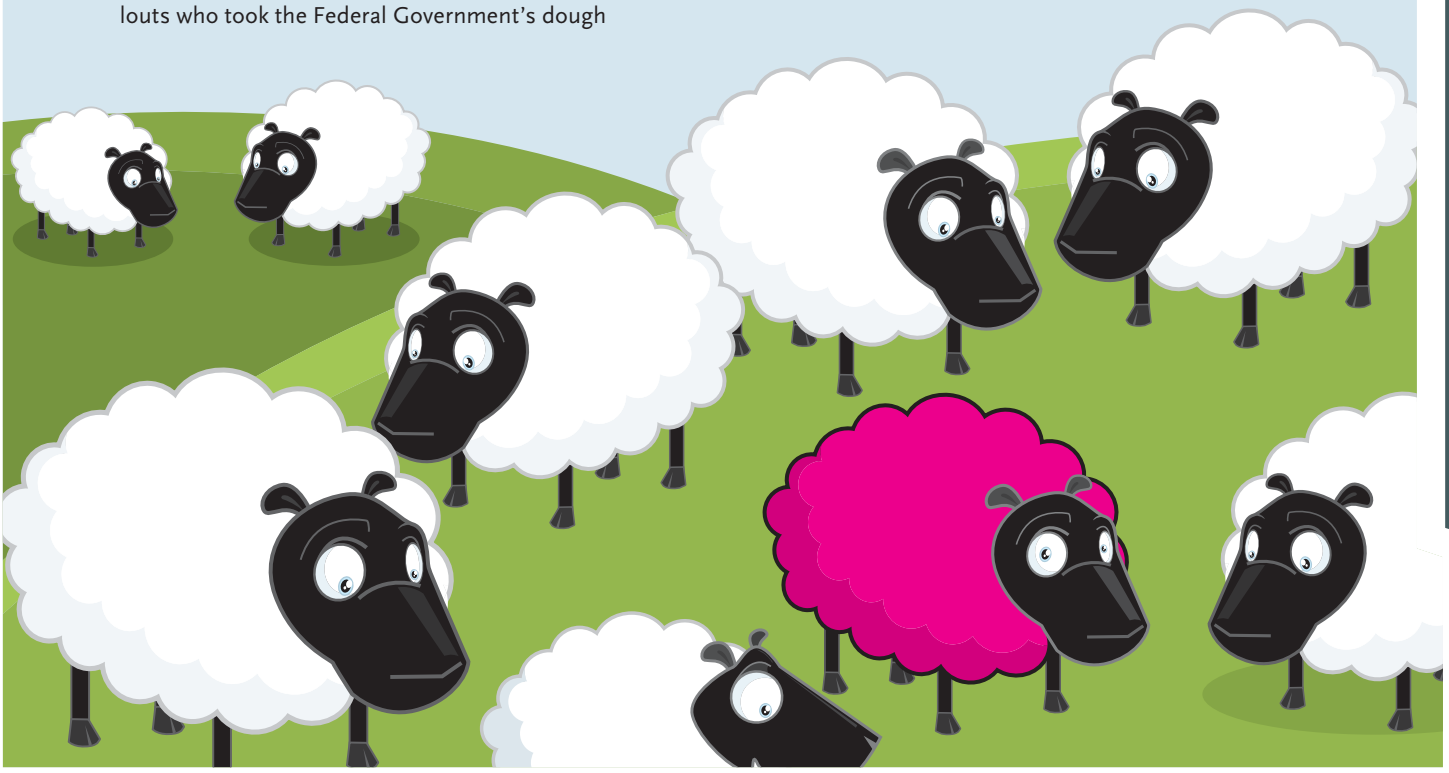
I was talking to a fellow who works at a Michigan precision parts maker whose product is 100 percent automotive. His view of the tattered marketplace defies the conventional wisdom to diversify, diversify, diversify. His strategy is to take advantage of the bankruptcies and "nervous Nellies" to pick up more of the high volume work he understands and knows will eventually come back.

It is a gutsy approach but perhaps it will succeed. He claims he's rarely seen so much work to quote.

Another interesting question to ponder is "what will happen if gasoline hovers from $1.50 to $1.75 a gallon for the next year or two?" Will Americans and Canadians decide they need the new F-150 truck or Chevy SUV or Chrysler minivan? These are the moneymakers for Detroit. But will the Al Gorians in the Obama administration like Carol Browner complain that this is the time to say no to the auto louts who took the Federal Government's dough and now want to return to their gas guzzler roots?

The auto guys will counter that if you ever want us in the black, let us car guys be car guys. They might also ask the Congressional Pelosians what they want to do with the spent batteries of 7-year-old Toyota Priuses that will start to blight the salvage yards because nobody will want to buy obsolete hybrids with decayed batteries.

Stay contrarian, folks. Someday you will be correct.



Today's Machining World

You can read *TMW* online before it's even printed!

www.todaysmachiningworld.com

Do you love Swarf?

Did you know that *TMW* readers from all over are reading and responding to additional Swarf entries on *TMW's* new Swarf blog?

Check it out at www.swarfblog.com

Ken Mink still has the "touch." He's playing guard for Roane State Community College in Tennessee, and his opponents fear him.

They are not afraid he'll blow by the man guarding him — not much chance of that. Ken Mink is 73 years old and resuming his college basketball dream after a half-century hiatus. Mink can play. He's no joke. He loves the game and has scored a few points this season to the utter humiliation of the young studs playing against him.

Mink is working on a book about the experience. After getting tossed off his first college basketball team in 1956 for allegedly spraying shaving cream around the coach's office (he denies it), he joined the Air Force and later became a newspaper editor. His wife supports his basketball dream and came to the first game dressed as a cheerleader with a poodle skirt.

I love the Ken Mink story, which I read about in the December 10, 2008, *New York Times*. I played basketball back in the 1960s and made a Chicago all-star team. Nice shot, no hops kind of player. What I loved about the story is that Mink is following his dream while risking the derision of teammates, opponents and fans. Most people focus so much on what they can't do — or think they can't do — that they miss out on the fun in life.

Ken, you the man. Ok, the Medicare man. Use the pump fake, put it up off glass and make the "and one." I'm with you.

Malcolm Gladwell wrote *The Tipping Point* and *Blink*, two of the best business books of the last decade. I just read his latest work, *Outliers*, and I highly recommend it. It is short and pithy.

Gladwell searches his world to find out why some people are extremely successful and others fail or just bump along. Gladwell does not burden the reader with a ton of data. He looks for big ideas and then finds interesting examples to substantiate his views. He is original, intuitive and writes so well it is easy to agree with him.

One of his major arguments is that highly successful people are the beneficiaries of a great work ethic and fortuitous timing. For Bill Gates the luck was to be from Seattle and to go to a prestigious, private high school that invested in a computer in 1968. It was bought from the proceeds of a PTA parents' fundraiser. At that time very few high schools had computers. Gates, at the age of 15 became totally fascinated by the machine and spent every spare moment developing his programming skills. While in high school he found that the University of Washington in Seattle had a computer lab which they were not using from 3:00 a.m. to 6:00 a.m. He would slink out of bed and take the bus to the University where he continued his practice on computers. He was a prodigy, and the Bonneville Dam Authority was looking for help in programming their computers at the time. Teenage Bill was asked to lend a hand. By the time he got to Harvard, where he dropped out his sophomore year to start Microsoft, Gates had close to 10,000 hours of practice on the best computers of his time.

Gladwell gives the reader several examples of the importance of concentrated and lengthy practice as a youngster setting up huge later success.

Gladwell discussed the Beatles, which John Lennon and Paul McCartney started in Liverpool as teenagers. The band was languishing in small clubs when by luck a musical entrepreneur heard about them while visiting London. The businessman needed musical talent for his Harburg, Germany, strip clubs that stayed open for most of the day and night. The Beatles worked cheap and had a good work ethic so he signed them up. In the early 1960s when the band was in its infancy the foursome had an opportunity to grow their skills by playing eight hours a night several days a week behind the bump and grind. By Gladwell's figuring, they practiced and played 10,000 hours together before they got their big break on the Ed Sullivan Show in the U.S.

Gladwell also used the example of the development of superb Junior Hockey players in Canada who polish their early skills in hundreds of tough games as teenagers.

Gladwell's thesis is that somebody may have great talent, but they need the opportunity while growing up to practice 10,000 hours before they can ripen into greatness.

I believe that in business, a trade or a profession it takes five years of practice, at least, to feel confident in oneself. If you take the opportunity to learn from good mentors and really work at it without dropping out in dejection, chances of success are strongly enhanced. The vagabonds who jump from career to career, job to job, are usually shortchanging themselves.

The decline in asset prices is so precipitous at the moment it is hard to judge what is a good buy. Recently, Emily Halgrimson, *TMW's* Managing Editor, told me she was looking for a place to live near our world headquarters. She asked for my advice on buying versus renting, and I urged her to rent in the precarious market of the moment.

A few weeks later she told me she had found a house that she really liked — three bedrooms, pretty yard, attached garage, lovely street. I asked her where it was and she said Flossmoor, Ill. I know Flossmoor intimately because it is a short walk from my home. I asked her the price and she said $115,000 out of foreclosure. "You've got to be kidding," I gasped. She said, "I offered $98,000 but they refused." I wanted to see this house.

swarf

So we drove over and I saw the house was nice on the outside, a short walk to the commuter train and undeniably a steal at $115,000. More research showed that it sold for $260,000 in 2006. Real estate taxes were high, $7,000 per year, in line with the 2006 sales price — but a new assessment could cut them in half.

I knew real estate was soft but Emily's find exposed two realities of the moment. Prices are all over the map, revealing the confusion of the moment, with sellers reluctant to take a beating.

But in cases where a seller, like a financial institution, decides it really wants to move a great property, a buyer will materialize to take advantage of their distress.

I recently read about new condominiums in West Palm Beach, Fla., that were just auctioned off. They found buyers at $225,000 — less than half of the previous offering price.

This kind of action reveals that there are still real buyers in the wings who will step in to take advantage of the drastic reductions. The market is not frozen. It is searching for a bottom. At some number buyers will step up. We are seeing it in California where houses are starting to sell — but only at half-off prices. When the market starts to clear the bargains, the prices will rise quickly off the bottom because buyers will be afraid of missing out on great deals. It's just starting to happen with cheap mortgage money and loads of foreclosures.

The start of a solid bottom in housing is upon us, and a lot of folks will miss it because of fear and paralysis.

I was recently asked to judge a contest for small businesses to find the best ideas for sales and marketing. I decided to do it because I thought I might learn something from the entrants, who wrote a brief account of a

marketing effort that worked for them.

Many of *TMW*'s readers run job shops and smallish manufacturing operations. They tend to be focused on the technical and logistical parts of management and prefer watching over the shop to meeting the customer.

Here are a few ideas to consider.

1) Visit your best customers yourself. My guess is that most of your clients are relatively close by but you haven't pressed the flesh with them for a year. Business is done on your reputation. Communication is via email or invoice. Get on your bike and visit them. They probably have more business to give you if you give them a good reason to do it. They have needs that you can satisfy, but neither of you know each other's issues and capabilities. You may set up the appointment with an email asking to have a phone conversation scheduled, which can spawn an in person consultation.

2) Post a short video online about you and your company and send a link to it via email to your clients and potential clients. Rent email lists of prospects. *TMW* rents our email and mailing lists quite reasonably as do other organizations and publications. A monthly E-newsletter that tells people about what you do and how you do it can puncture the indifference of potential clients. It will have extra power if you send it with a short and informative video — even if it is relatively crude.

3) Write a personal thank you note to your loyal customers. It can be typed or handwritten but it cannot be canned. They have to know you really mean what you say. If you are clear and authentic you will connect with your customer, which will mean future business.

I'll end this piece here and actually go and follow my own advise. Happy New Year.

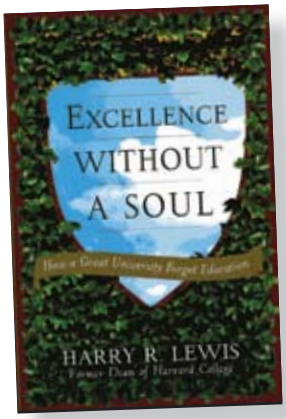
By Jerry Levine

Excellence Without a Soul

When I chose to review *Excellence without a Soul* by Harvey Lewis, the former dean of Harvard College, I was curious why he would write such a book. What could be the trouble at the apex of academia? Lewis had ended his term as Harvard's dean during the reign of the school's infamous president, Lawrence Summers. What could he illuminate about the turbulent tenure of Summers? Intrigued, I read the book, hoping for a voyeur's view inside those ivy-covered walls.

Although I expected a cheap diatribe or exposé, Lewis gives the thoughtful, impassioned argument of a well-grounded educator. He calls for a return to a value driven, liberal education to be used for the betterment of humanity. He says, "The most important goal of a Harvard education is a philosophy of life that brings dignity and honor to human affairs."

Lewis contends the primary responsibility of any university is to turn adolescents into wise, self-reliant adults. But he believes that Harvard currently has only a "hollow excellence."



He finds fault in several areas, starting with the teaching. Obviously, any Harvard professor is brilliant and an authority in some specific area. The problem is that professors are hired specifically for these traits and not hired as mentors of values and ideals. Most students remember specific professors for the values they instilled long after they've forgotten the facts they taught.

When Summers first arrived at Harvard, he ordered a university-wide curriculum review, but rather than put a stamp on the faculty's thinking, he abstained from the process. Lewis claims that the professors came up with a curriculum with no meaningful expectations, one they hoped would please the students and their parents and avoid academic turf wars among themselves. He also says they proposed adding more exotic minutia of their own interest at the expense of basic humanities and science.

Lewis discusses grades and grade inflation, but with mixed feelings. Over 50 percent of Harvard's grades are A's and A-minuses, and 90 percent of the students graduate with honors. There has been a steady rise in grades since the 1930s. Some of this improvement he recognizes as legitimate, as it can be attributed to better students, better teaching and smaller courses.

Lewis debates money and athletics, which was part of his purview at Harvard. Money is a barrier to a more diverse student population, but Harvard and many other elite schools are devising ways to mitigate that problem. He takes a very positive view of college sports — one that is contrary to many at Harvard. Often academics view athletics with distain because they revolve around competition and money. But of course, competition fuels most things at an Ivy League school and money is vital as well.

In the end, Lewis saves his sharpest criticism for Lawrence Summers' short tenure as University president. He says that "the brilliant economist was a poor business manager." During his presidency the previously balanced budget of the Arts and Sciences department ballooned into a $40 million deficit. Summers hired many high-priced consultants, which Lewis says resulted in a swell of bureaucracy and a stunted flow of daily business. He believes that Summers sent the University down the road of "excellence without a soul" and says "Summers' misfortune arose from his impatience, harshness, thoughtlessness and lack of candor."

The book concludes with the story of a period of unrest over race relations at Harvard in 1992. Part of the university's response was to require all entering freshmen to read Ralph Waldo Emerson's 1841 essay, "Self-Reliance," and meet in small groups with a dean or faculty member to discuss it. By reading Emerson (coincidentally Harvard class of 1841) everyone could draw on their own traditions and come to grips with some of life's important questions.

Having students believe in themselves primarily as individuals and not as members of an identity group, builds confidence in principles and judgments and is key to educating citizens and leaders. To Lewis, this leads one to a philosophy of life that emphasizes dignity and honor in human affairs.

Comments? You can email Jerry Levine at jerroldlevine@yahoo.com.

fresh stuff

▲ All at once

Mazak's new multi-tasking HYPER QUADREX 100MSY features two horizontally opposed spindles, each with a 6-in. through hole chuck. The turning spindles each generate 15 Hp and 6,000 rpm. The machine also features upper and lower 12-position tool turrets, both capable of traversing in the Y-axis for off-center machining operations. Fixed and live tools, powered by 6,000 rpm, 7.5 Hp spindles, can be mounted on both turrets.

For more information, please contact Mazak Corp. at 859-342-1700 or visit www.mazakusa.com.

▲ Lightening fast

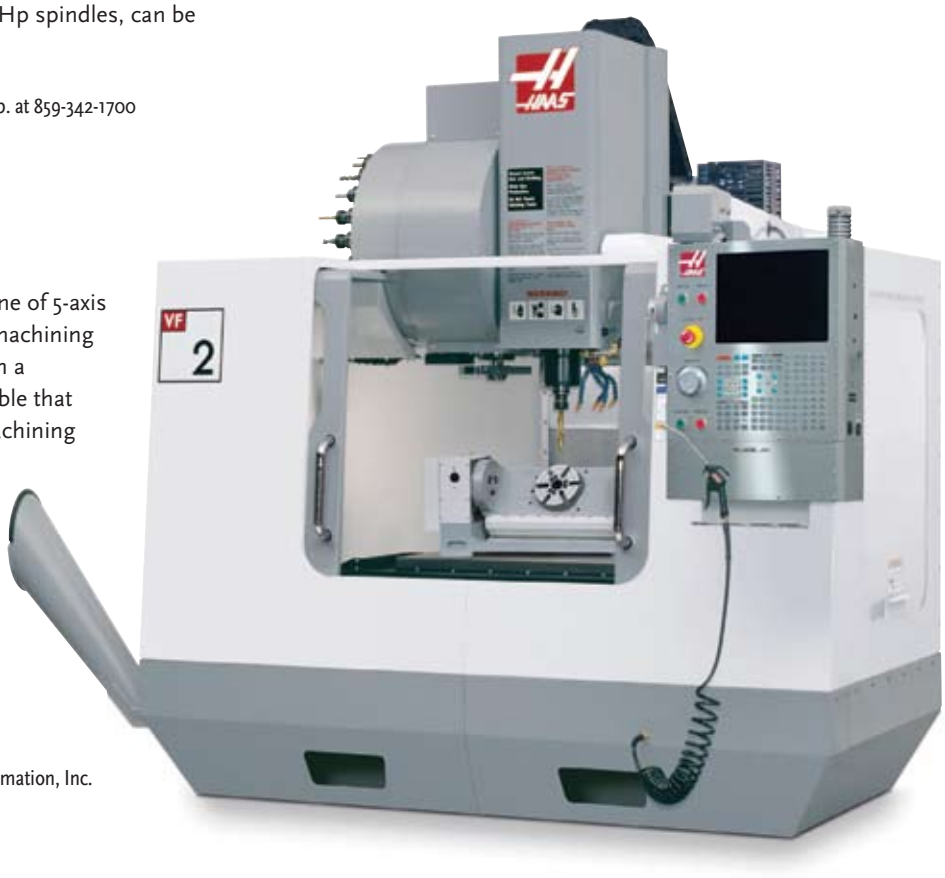
Eurotech introduces the fast Lico S Series which runs up to five cutting tools in the work piece at one time. It also has four slides for ID or OD work on main spindle, an eight-station turret with live tools on each station and a sub-spindle with four gang tools or three live tools for sub-spindle work. The Lico S series has a 1,000 PSI coolant system, a parts catcher for both main and sub-spindle and a parts conveyor.

For more information, please contact Eurotech at 352-799-5223 or visit www.EurotechElite.com.

▶ Very fast, too

Haas Automation, Inc., expands its line of 5-axis machines with the VF-2TR trunnion-machining center, a compact VMC equipped with a factory-installed dual-axis trunnion table that provides full 5-axis capabilities for machining complex multi-sided parts in a single setup, which reduces setup time and increases part accuracy. The VF-2TR features a Haas TR160 dual-axis trunnion table mounted to the standard T-slot table to provide 5-axis simultaneous motion or position a workpiece to nearly any angle for machining.

For more information, please contact Haas Automation, Inc. at 800-331-6746 or visit www.HaasCNC.com.



▼ Flexible Clamps

Sandvik Coromant recently released a new range of Coromant Capto® machine adapted clamping units (MACU) for lathe machines. The new Capto products provide the flexibility to change from one system to another very quickly, and will also channel high pressure coolant from the latest CoroTurn HP cutting heads, reducing temperatures and improving chip control. The machine adapted clamping units will be available for Mazak, Mori Seiki, Nakamura Tome and Okuma machines.

For more information, please contact Sandvik Coromant at 201-794-5223 or visit www.coromant.sandvik.com/us.

▲ Guiding straight

NSK Precision America's new HA Series of linear guides integrate a variety of the company's proprietary technologies to provide high motion accuracy, rigidity and load capacity. The use of ultra-long ball slides achieves high motion accuracy in both narrow and wide ranges. Additionally, the unique design of the HA Series ball recirculation components ensures smooth ball movement and minimal passage vibration.

For more information, please contact NSK Precision America at 317-738-5089 or visit www.nskprecision.com.

▼ Water deal

MC Machinery Systems, Inc. introduces the second generation of its newest product line, Mitsubishi Waterjet. The Mitsubishi 700 Series CNC control delivers advanced programming capabilities for high-precision machining. The unit is controlled on a 15-inch waterproof screen, with improved graphics and NC design to simplify operation. Beginning in early 2009, all Mitsubishi Waterjets will be manufactured in America.

For more information, please contact MC Machinery Systems, Inc. at 630-616-5920 or visit www.mitsubishi-world.com

fresh stuff

◀ Smoother finish

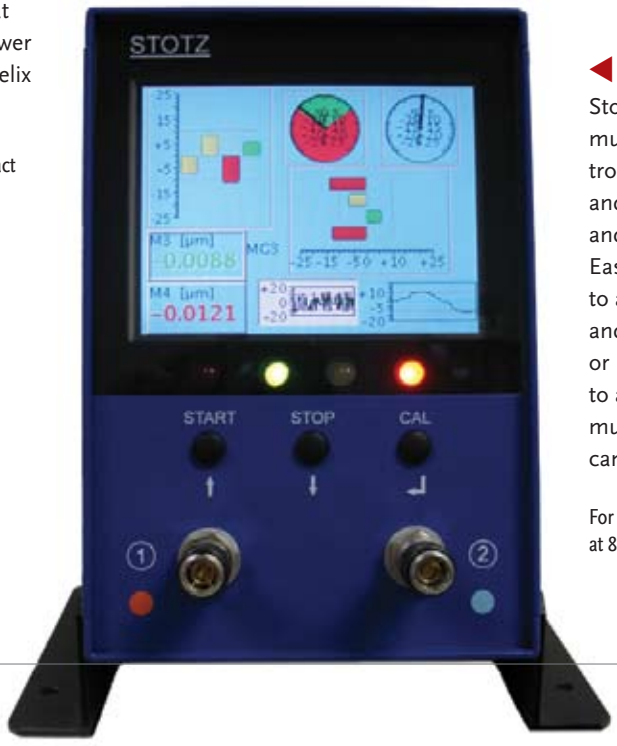
OSG Tap & Die introduces the new EXOCARB® Aero™ ROUGHER which is designed for maximum metal removal in exotic materials such as Stainless Steel, Titanium, and Inconel. The combination of the shallow profile serration and the 45 degree helix provides a much smoother surface finish. The uniquely configured serrations on the cutting edge reduce friction, thereby generating less heat and requiring less horsepower than standard or variable helix carbide end mills.

For more information, please contact OSG at 800-837-2223 or visit www.osgtool.com.

▲ Strong quality

Toyoda Machinery's new bridge type machining centers have a large Meehanite cast iron base which offers higher density and uniform soundness than traditional cast iron. The machines' work area ranges from 83 to 239 inches in the X-axis. The automatic tool changer technology delivers drastic improvements in high-quality part throughput. A full splash guard, dual chip conveyors, and a Fanuc CNC make the machines easy to use and maintain.

For more information, please contact Toyoda Machinery at 847-253-0340 or visit www.toyoda.com.



◀ Multi-control

Stotz USA, LLC announces the new MSK multi-functional measurement and control device, which combines pneumatic and tactile touching for both in-process and post-process component inspection. Easy to operate, the MSK is adaptable to all statistical process control software and has the ability to network Stotz MSL or MSG columns, with output channeled to a single location via Ethernet. Thus, multiple measuring stations in a plant can be monitored on a single data line.

For more information, please contact Stotz USA, LLC at 815-297-1805 or visit www.stotz-usa.com.

By Emily Halgrimson

Turning Hardship Into Hope

A St. Louis program focuses on manufacturing's thirst for skilled CNC machine operators to elevate hard-to-place workers.

The Manufacturing Training Alliance (MTA) in St. Louis, Missouri, faces a daunting task — turning minimally skilled workers, ex-felons, and even the homeless into hirable CNC machinists. Although the MTA in St. Louis has been functioning for 10 years, it's only in the past five the program has made a sizeable contribution to educating the industry's workforce. Jason Taylor, a recruiter for Aerotek Commercial Staffing Company, says when he first started with Aerotek, he had about a 20 percent success rate with MTA graduates getting hired after the 90-day probationary period. They now have about a 65 percent rate. "It's very good [quality] now," he said.

The program, which has led more than 500 new workers through its 16-week advanced manufacturing course, started after a local boy was injured in a drive-by shooting. The community decided that there was a need to work with at-risk youth in the area. "There was a lot of gang activity going on at the time," said Jonathan Bolden, the vice-president of the MTA's Education and Training Department. But over the years, with the rise in layoffs, the MTA has started focusing mostly on adults. Some young people still go through the program, but the average age is now about 28.

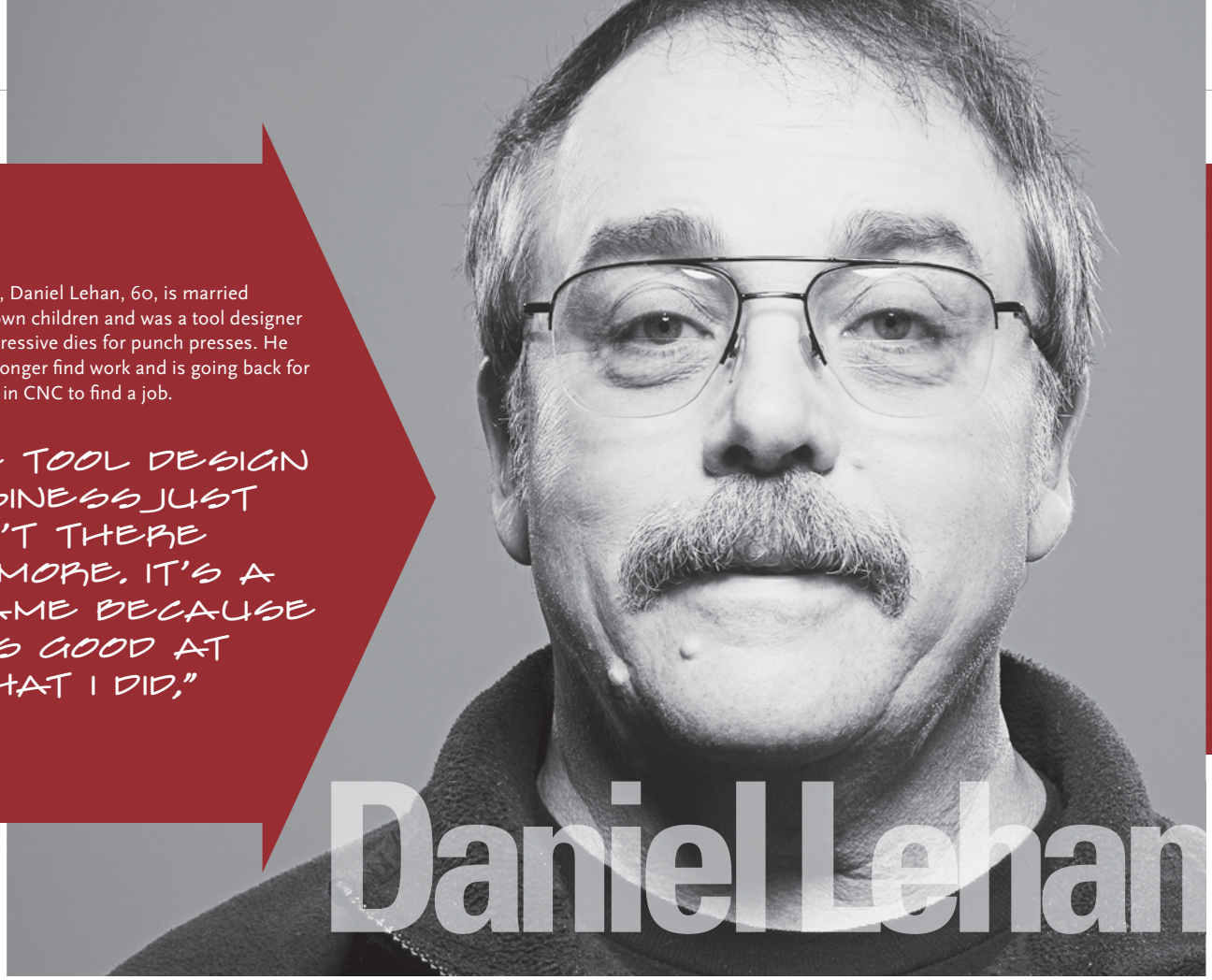
The MTA shop floor in the old Wagner Electric building on the run-down west side of St. Louis has nine machines in the shop. "We have two different types of mills and a 3-axis Tree-vertical machine. That's what I like to start with. Then I step them over to the Vertical machining center where they get a chance to deal with automatic tool changers and different types of setup," said Eddie Welch, the instructor of the advanced manufacturing class and a graduate of the program himself. The shop also includes a 2-axis horizontal lathe the students practice turning parts on.

Photography by David Torrence Photography, St. Louis, MO.

"[THIS PROGRAM IS] KEEPING ME FROM DOING WHAT I USED TO DO, WHICH WAS DRUG AND GANG STUFF, AND IT'S KEEPING ME FROM HANGING AROUND THE GUYS I USED TO HANG AROUND."

Darvell King

Darvell King, 28, and a student at the MTA, was locked up for five years after allegedly watching his cousin kill someone and not reporting it. He realizes it may be hard for him to find a job because of his background but is hoping that someone will give him a chance.



Student, Daniel Lehan, 60, is married with grown children and was a tool designer for progressive dies for punch presses. He can no longer find work and is going back for training in CNC to find a job.

"THE TOOL DESIGN BUSINESS JUST ISN'T THERE ANYMORE. IT'S A SHAME BECAUSE I WAS GOOD AT WHAT I DID."

The advanced manufacturing program teaches CNC setup and operation, and also has a prep program which includes forklift certification, OSHA certification and blueprint reading — completely free of cost. It also provides job placement and encourages its students to continue their education. "Even after you're done here you can go through the CAD program and it's all funded for you," Welch said. "Then you have the background to continue into programming, master machining, or tool and die. This opens up a whole new world." The 16-week course gives students the basics so they can get their feet in the door of the manufacturing industry. "You can learn theory in the classroom, but you have to be able to put your hands on it. Like anything else, it's a skill," Welch said.

The Loss of Jobs

In 2000, when more and more manufacturing jobs were going overseas, many people wanted to shut the program down. "They said, 'there are no jobs,' and 'we don't think [the program's] necessary,' which told me that they didn't understand manufacturing. Everything that's not grown from the earth or drops from the sky has to be manufactured," Mr. Johnson, the president of the MTA, said. He belives that there will always be manufacturing in America but it's necessary to be prepared for changes in the industry. "In order for us to compete we will need to automate and increase productivity," he said. "And for minorities and women — it's so hard for them in a downturn in the industry to even get in. Our program is 90 percent minorities and women. We target them." There's no other training institution in the region that claims to train people in advanced manufacturing for free, especially in 16 weeks.

There are approximately 1,300 new job openings a year related to manufacturing in the St. Louis area, and the MTA's maximum training capacity is 120 students per year. So the MTA feels confident that they'll be able to place 90 percent of those they train in jobs. "When you stop training and you start getting these contracts that are coming back from China and India, you must have a skilled workforce," Mr. Johnson said. What works for MTA is the concept of getting people basic training and skills and finding them entry-level jobs in a short period of time.

Daniel Lehan, a 60-year-old married man with grown children, was having trouble finding a job when he came across the MTA. "I was the tool designer for progressive

dies for punch presses. You can't find a position for that anymore. The economy's so slow and they're shipping all of that stuff over to China," he said. After being laid off and unable to find work as a tool designer he took a job as a tool crib attendant. But the company made automotive parts and because of the recent economy, had to lay 38 people off — Daniel was one of them. "So I went ahead and got on unemployment. I knew it was slow, but I never knew it was that slow," he said. In one of his job interviews they said if he knew how to operate CNCs he could be a part-time tool designer and then work on the CNC machines, too. So after seeing numerous ads for CNC jobs he thought he'd give it a try. "It's worked out well because I have good math. Hopefully I can send out resumes soon with my graduation date, so they'll know when I'll be done. Then I'll get a job really quick, because they place you here also," he said. He's hopeful he'll get a job out of this but knows he'll have to work at least another seven years before being able to retire. "Maybe 10 the way they're talking," he said.

The MTA claims to use the existing workforce/welfare system the way it's supposed to be used. "When someone's unemployed you find a way to give them a skill or some additional training so they can go back out and get reemployed," Mr. Johnson said. All of the graduates finish with six credit hours at St. Louis Community College. "Some folks are the first generation college folks in the family. When they get that college ID I see a change in attitude. For a family that's struggling and hasn't had a lot of educational attainment, you go home and Mom or Dad are saying, 'I'm a college student.' It changes family attitudes about learning," Mr. Johnson said. "That's one of the biggest challenges: To change a blue-collar worker's attitude about learning."

Hope for Stability and a Livable Salary

Along with the lure of a higher salary, the potential for basic job stability attracts the students at the MTA to manufacturing. Earl Aitch III had a background in chemistry before landing himself in prison with a DWI. His hopes for regular salary increases are much higher after completing the program. "I'm gonna get my experience where I have to, to get up there." But he knows patience is necessary. "Nothing's gonna happen overnight. If I see a salary cap at any place then I know it might be time to, you know... put my resumé out there again," he said. Even more important than salary for Earl is knowing he'd have a job in the future. "I've worked all my life, so money isn't the biggest object right now — it's stability." Earl was in construction for some years, but wanted out of the back-breaking seasonal work. He's willing to trade a higher

Eddie Welch (left) works with two students on the machines. The advanced manufacturing program meets five days a week from 8 a.m. to 3 p.m. The class usually begins with around 15 students and by the end of the 16 weeks is down to 7 because of a strict attendance policy and frequent drug tests. Ninety percent of those who graduate are placed in jobs.

"I DON'T KNOW HOW EASY IT'LL BE, BUT I'M WILLING TO DO WHATEVER IT TAKES,"

Student, Jameca Harris, has big hopes. Her smile and nervous laugh don't hide her dreams of finding work with a decent salary. Her background is in the culinary field and she and her daughter are placing big hopes on Barack Obama's presidency. Jameca is excited about finding a job in machining.

salary for some regularity. "In a few years I can make at least $40,000, but that's cool with me because it's Monday through Friday and I get my weekends off, paid vacation and great health benefits. It's the American way. That's what you want," he said.

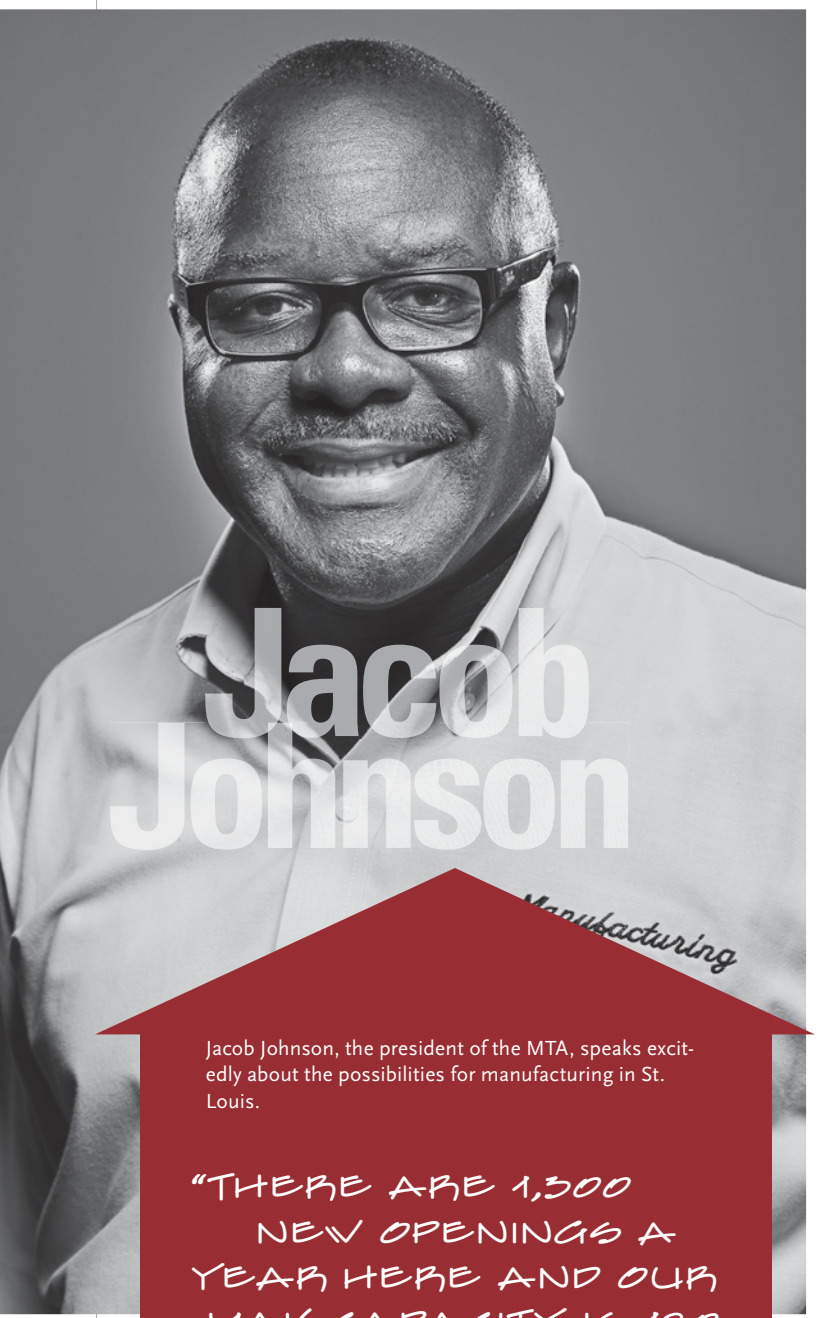
Jason Taylor of Aerotek has two offices in St. Louis and focuses on staffing the manufacturing sector. He said that one of the reasons a company would look to hire from a place like MTA instead of a traditional vocational program or tech school is that a lot of his clients are looking to fill entry-level positions and a lot of the students who are coming out of the MTA are okay with making $10 or $11 per hour. "You go to some of the other technical schools in the area and [graduates] are looking to make $18, $19 or $20 per hour right out of school," he said. Taylor says that's just not realistic. "I'd say that maybe one out of 10 is going to find that job making $20 per hour. The individuals who come from [the MTA] I wouldn't say are less qualified, but they do come from a different background, and they're okay starting out at $10 or $11 or even lower, to get their foot in the [door at a] company," he said. He thinks a lot of the manufacturing companies hiring right now appreciate that, and he thinks that some of these individuals will probably work even a little bit harder than some of the other applicants. "They have a little bit more to lose if they're not working than someone who comes from a trust fund," he said.

Eddie Welch says part of his job is placing students into companies that not only provide room for advancement, but also a livable starting wage. "A lot of companies come in offering $8 or $9 per hour and I kind of push them out the door, because you can't live off that," he said. The normal starting wage for MTA graduates is $12 per hour.

Who's Hiring?

Even though the U.S. is experiencing record job losses, there are still people out there recruiting qualified employees. Jason Taylor of Aerotek has clients give a specific job description to him and he tries to fill that position. "CNC is one of our biggest [job openings] right now, actually machining all around," he said. "We are most definitely finding an increase right now." But he also says that the majority of the individuals who come out of the MTA program don't start CNC jobs right away. "CNC is not the only thing we work with. We have other jobs like drill press, punch press and brake press, maybe something more entry level." A lot of these individuals just want to get their foot in the door in some manufacturing company that

maybe has a CNC machine, so that down the road they can move up to it, he said. Jason has been recruiting MTA graduates for five years and he says the training program has grown a lot. "They've turned it around. Quality has been phenomenal," he said.



Jacob Johnson, the president of the MTA, speaks excitedly about the possibilities for manufacturing in St. Louis.

"THERE ARE 1,300 NEW OPENINGS A YEAR HERE AND OUR MAX CAPACITY IS 120. SO FOR 90 PERCENT OF THE STUDENTS WE FEEL VERY CONFIDENT THAT WE'LL BE ABLE TO [FIND THEM JOBS]."

Eddie Welch thinks that the higher age of his students is attractive to employers. "We have an older crowd that has already been through that young stuff," he said. "They've worked before and some of them have kids — so they're more focused, even though they might have had a little trouble in their past." He thinks that sometimes those life experiences make you humble. "If they weren't already, they are now," he said.

Connection to the Industry

One strength of the program is that the curriculum is based on what the companies who are hiring say they want in new employees. "We have an advisory board where a lot of shop managers come in month to month and actually tell us what they want and expect from their employees," said Welch. As a result, the MTA is constantly changing the curriculum so the students are more marketable. "We don't just teach the CNC operations here. We teach the set-up side of it too, so there's a little more skill involved," he said.

Nowadays the biggest trait employers are looking for is a strong work ethic. Welch can have someone who knows shop math, someone who's had experience in the shop and knows blueprints, but a company won't want that person if they aren't at work every day, aren't on time and aren't reliable. "I give my students a little pep talk at the beginning of the class. A job is a job, I don't care if you're at McDonalds or wherever. You're going to have to be there everyday and on time, or you're not going to have a job," Welch said.

Jameca Harris is a young, single mother. She says that she likes that few women do machining. She's also appreciative that the MTA offers job placement. Before starting the program she worked in the culinary field. "I wanted a change so I thought this might be interesting," she said. She's hopeful that she'll find work. "I don't know how easy it'll be but I'm willing to do whatever it takes," she said. She discovered the MTA through the Missouri Career Center. "A lot of people are out of work and it's kind of scary. But I think in this area it might be a little easer to find a job," she said. Jameca thinks that a lot of people who are competing with her for the same job may not have the same kind of training. "You know, we've got to do a lot of math and the others won't have the same experience. Sometimes people are scared to go into a job because they know they don't have the training. This makes you more confident," she said.

Challenges

Like any other program set on changing the fundamentals of people's lives there are obstacles. The class starts with 15 students and after the first four weeks is typically down to 12 because of a strict attendance policy. "We work for the students but also for the employers, so when we send them to somebody they gotta be ready to go," Mr. Johnson said. "If you can't come to class on time you ain't gonna come to work on time." In eight weeks the MTA usually graduates seven and 90 percent of those are placed in jobs.

The students also have to pass a series of drug tests, which for many turns out to be a challenge. "We have two throughout the training. I guess they don't have this true belief that the test will catch them," Mr. Johnson said. "I've heard the excuses, but every employer will give them a drug test." Even so, there are always some who think they're going to get by. Some companies even give hair follicle tests, which will sometimes find traces of drugs from up to six months before. "For those employers, we know who we can send to actually get through the interview process," Mr. Johnson said.

Ex-offenders face special challenges. "It's a target population that has a lot of issues and barriers in front of them," said Jonathon Bolden. "It's really hard." That's one of the issues the MTA is fighting constantly: Finding employers who are willing to hire ex-offenders. Often employers say "we hire on a case-by-case basis," but again and again the ex-offenders are sent out there and the door is slammed in their faces. "Those employers we have had success with — those are the ones we focus on," Mr. Bolden said. But the MTA is always looking for new employers that will hire ex-offenders. It's a constant recruiting battle.

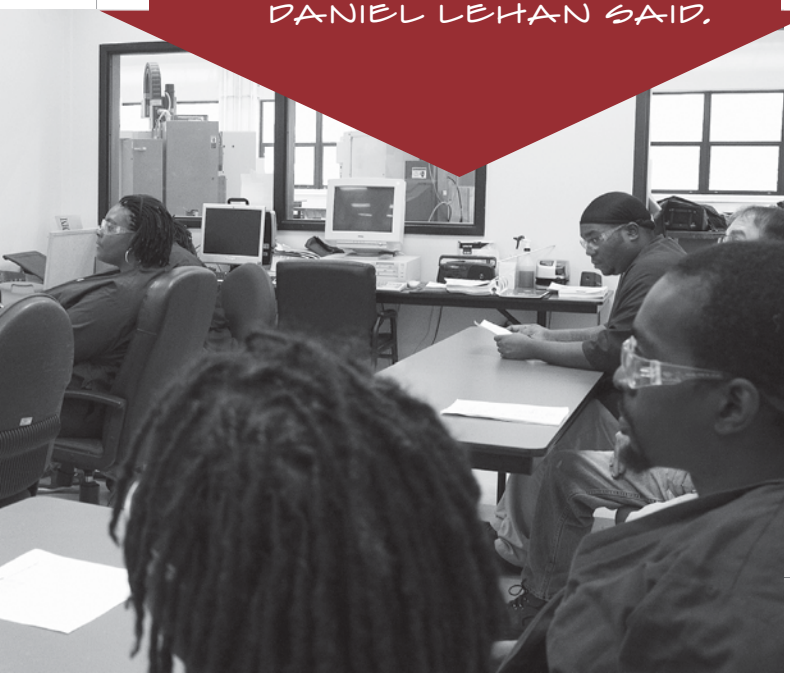
Darvell King, a 28-year-old man, has been in the program for 10 weeks. He says he was locked up because his cousin shot somebody when he was 12 and Darvell saw it. "I didn't report it, but they said I was supposed to tell them. For five years I was locked up. Before that I worked in telemarketing, I worked for a country club, in fast food and a cleaning company," he said. Darvell started a program in auto mechanics but didn't like it. He knows it might be harder to find a job with his background because a lot of companies have zero tolerance for felons, but he hopes that someone will see his experience with the MTA and give him a chance. "This program's keeping me from doing what I used to do — the drug and gang stuff, and it's keeping me from hanging around the guys I used to hang around." You eventually get there, he said. "My grandma use to tell me there's always a storm before the calm."

Jason Taylor notes that there are some individuals he

The inside of the MTA shop floor. It holds nine machines and has seen about 500 people go through the advanced manufacturing course in its 10-year history.

The students of the MTA meet five days a week from 8AM to 3PM. Classroom time decreases as students work more on the machines in the nearby shop. Eddie Welch gets accolades from his students.

"ED'S A GOOD INSTRUCTOR, HE'S BEEN DOING THIS FOR ABOUT 10 YEARS AND THE WAY HE EXPLAINS THE PROCEDURES AND EVERYTHING IS REALLY GOOD," DANIEL LEHAN SAID.



can't help because many companies have strict policies when it comes to backgrounds. "A lot of the violent offenses, there's just nothing I can do about it," he said. In Mr. Bolden's experience, many times when a company hires a violent offender, it's a job where there are going to be other violent offenders. "And it's gonna be a job that may be quite demanding. You gotta prove something, but that's with any job," he said.

Some recent grads get frustrated when looking for a job because it can still be really difficult to find one, especially if you're an ex-offender. Welch tells the story of one young woman who can't seem to get a break. "In my last class I had a young lady of 30 who was a violent offender, but she was 17 at the time. She really had a challenge to get employment. She had four kids and was a much different person. She could just not get that door to open for her." As far as he knows she hasn't been placed yet.

The Future

The MTA has seen steady growth since its inception, and it is believed that current layoffs in the U.S. will increase the demand for training. "We have a small staff of six, and I believe that with the current layoffs we will need to double our capacity and double our staff," Mr. Johnson said. The U.S. Bureau of Labor predicts a rapid increase in the need for jobs in the coming years, and MTA people are hopeful that manufacturing may be able to step in to fill some of that need.

The hope at MTA is that the new President will bring in an era of growth and stimulus. "There's definitely a change around here since the election. You can see a bit more hope," said Eddie Welch. Early on in the program the MTA's grant was cut and the program was forced to close its doors for several months. "When the grant got cut the last time I was here. That was when we had just put Bush in office. They cut the grant that was training people that was working and generating tax money around here," he said. "It was like, what do we do now?"

"This place is really changing lives," Welch said. "I've had people in my class that were actually homeless." One student was living under a bridge, and every day Welch let him keep his clothes at the school. "We have a shower back in the bathroom, and every day he'd come in and work and do what he had to do. Then he'd take a shower and go on back under the bridge," he said. He eventually ended up going to work and bought himself a house and car. "It's that kind of thing that makes me want to keep doing this," Welch said.

Graff-Pinkert & Co., Inc.

4235 West 166th Street, Oak Forest, IL 60452 www.graffpinkert.com

Over $1,000,000 of spare parts in stock on our floor

Wickman and Index Tooling Specialists

Tooling: Complete assortment of new and used spare parts and attachments.
In stock: Threading, pickoff, pusher tubes, cross slides, holders, conveyors, etc.
New and used: pickoff collets, feed collets, high speed drilling, chasing attachments, thread rolls, dieheads, air cleaners and more

phone 708-535-2200 fax 708-535-0103

gpc

Shop Graff-Pinkert online

for web exclusive listings and prices

ebay gpc

http://stores.ebay.com/graff-pinkert-screw-machines

CURRENT INVENTORY

Serviceman available with machine purchase. All machines can be equipped with threading, pickoff or thread chasing. As you want it.

WICKMAN
5/8" 6-spindle, thdg., pickoff, 1971-88 (8)
1" 6-spindle, 1960-1992 (9)
32mm 8 spindle, 1997
1-3/8" 6-spindle, 1967-1979 (3)
1-3/4" 6-spindle, 1965, 1993 (10)
1-3/4" 8-spindle, 1970
2-1/4" 6-spindle, 1962, 1973-79 (3)
6-5/8" 6-spindle, 1979

ACMES
1-1/4" RB8, 1981
1-5/8" RBN8, thdg, 1979, thdg., pickoff
1-5/8" RB8 thdg., pickup '68-72 (5)
2" RB6, 1979
2" RB8, 1973, like NEW 1978, '74
3-1/2" RB6, heavy recess, '66

B & S and INDEX and Esco
G200, 1997, Index
G300, 1997, Index
ABC 60mm Index '96
00-R/S 1/2"
D-2, D-4, D6SR Esco

SCHUTTE
SF 51, DNT, 1985 (2)
AF32, DNT, 1998 (2)

CNC SWISS
Star SR-20, 1998

NEW BRITAIN
Model 51, 1970
Model 52, 1980, thdg., pickoff
Model 62 2-1/4" 6sp., 1975, heavy thdg.

DAVENPORT
3/4" thdg., pickoff, longbed (4)
3/4" 1981 (4)
3/4" thdg., pickup, 1977-66 (8)
Noise Tamers

HYDROMATS
Pro 20, 1999
HW 25-12, 1994
HB45-12, 1996
HB45-16, 2002
HS16, 2001
CNC 36/100 HSK tool spindles w/2-axis CNC flange and valves w/ 6-axis CNC, new in 2006.
VE 20/80 QC unit
26/80 QC unit

ESCOMATICS
D9 (2), 1995
D6SR (2)

MISCELLANEOUS
Davenport Noise Tamer (5)
Acme Recess 3-1/2 RB6
Davenport slotting- $1,850
2 5/8" RB6 spindle bearings
New repair parts- 3/4 RA8, 1-5/8 RB8
Reed B-13 thread roll attachment (3)
3-1/2 RB6 thdg. attachment
IMG recess 1-5/8" RB6 (2)
3 1/2" RB6 threading
C&M Wickman pickoff 1" and 1 3/4"
Davenport cross drill, pos. 3 or 4
Hydromat recess unit and flange
New Britain 3rd position slide
Davenport chip conveyor
5 1/4" RAC spindle bearings
Intersource Chip System
Wickman thread chasing 5/8" – 3 1/4"

Wickman and Index
ASK FOR OUR IN-HOUSE PARTS EXPERT

Cathy Heller Wickman and Index Parts manager

Phone 708.535.2200 Fax 708.535.0103

sales@graffpinkert.com.

Lloyd and Noah Graff interview steel expert John Tumazos

Has scrap become junk?

TMW **recently interviewed metals analyst John Tumazos, principle founder of John Tumazos Very Independent Research LLC., to get an expert's perspective on today's volatile, world steel market. Tumazos has been recognized as a top analyst 42 times in the annual Institutional Investor survey for metals, regarded by many as the most comprehensive survey of Wall Street analysts.**

NG: How did you get into the steel business?

JT: I was working for an investment firm in New York out of school. I grew up in Pittsburgh, and I figured I'd get free trips home if I studied the steel business.

LG: We're seeing steel prices decrease rapidly. What is going on?

JT: Prices are coming down in the ingredients markets and coming down much more quickly abroad than in the U.S.


World decline
was 2.9 percent.
Europe and the
U.S. were
9 percent, and
almost as much.

LG: Where specifically? Europe, China?

JT: Asia, in particular. It may appear as if the global recession is very synchr onous — that markets are linked by trade, the financial system and by commodity prices. In September, the first month that steel output fell year-on-year worldwide, the world decline was 2.9 percent. Europe and the U.S. were ± 1 percent. China was down 9 percent, and Russia and Africa were down almost as much. In October, the world decline was 13 percent. China was down 17 percent and Russia was down 33 percent. The declines are more severe abroad.

LG: Are the producers cutting production as fast as the prices are falling?

JT: The producers are cutting production when they don't have orders.

LG: We saw one big mill in the Midwest cut workforce and production by two-thirds. Are you seeing that great a cut in production all over?

JT: In late October the operating rate was 56.5 percent in the U.S. It's obvious everybody's cut a lot of production.

LG: What was the percentage six months ago?

JT: Ninety percent. In the last five years when steel prices were high, there may have not been any shortage of furnaces and rolling mills, or steel capacity. There did appear to be shortages of ingredients — scrap, metallurgical coke and iron ore. And in the U.S. the price increases were mostly due to raw materials markups, and maybe some industry consolidation. Because world output fell 13 percent in October and 3 percent in September the ingredients markets have moved into surplus — and that's burst the bubble. So in my opinion the price of steel is less related to domestic operating rates than surpluses in world ingredients markets. Clean scrap, such as Nucor would use in making sheet steel, has fallen from $890 per ton to $125.

NG: Which is a cheaper way to produce steel in this market – with scrap or an integrated mill?

JT: It depends from day-to-day. It's probably cheaper to use scrap at today's prices. It wouldn't have been in July.

LG: Do you think that mini-mills can maintain margins because their raw material costs are going down so rapidly?

JT: In the short term their margins might expand, because the scrap price fell so sharply and they're trying to cut their prices as slowly as they can. They also have LIFO accounting profit accrued on the scrap. Nucor has scrap price surcharges. They use benchmarks for scrap that were the highest priced grades of scrap in the highest priced regions. So they were surcharging one cost level but buying their ingredients for probably $100 to $200 a ton more cheaply than they were surcharging. So the high posted raw materials prices were a bonanza for Nucor and the other mini-mills that followed Nucor's pricing.

LG: And today?

JT: Today they're still charging closer to the peak and not reflective of today's scrap prices. If they were charging based on today's scrap prices they'd be selling steel for $350 or $400.

LG: And what are they selling for?

JT: I've been reading $650 in the trade press for hot rolled sheet, over $1000 for beam. So I don't think domestic prices have fallen very much yet.

You may have seen in October, 3 million tons of steel were imported. And in the month of September the import penetration was 31 percent. It appears that foreign prices are about $250 a ton below U.S. prices on average. And if your customers want to get the lowest price, the easiest way is to order from abroad.

LG: We hear that in a lot of cases dealers aren't even taking the scrap

JT: Well, if their yard is full and their balance sheet is used up, they're stuck. Scrap wastepaper is selling on the docks for zero — or near zero as an alternative to paying the disposal fee.

LG: How about the warehouse prices? Are margins fatter now because raw materials are cheaper?

JT: No, many of them may be insolvent, because they were loaded up with steel when steel was over $1000 a ton and the price fell very rapidly.

LG: So they're unloading their high priced material and trying to stay alive.

JT: They're basically stuck. When the price falls 50 percent very quickly it's not a good business holding inventory.

NG: Is the steel imported from abroad, particularly from China, very different in quality than domestic?

JT: A great deal of brand new equipment has been installed in China in this decade. About 80 percent of their steel capacity is newer than Nucor's newest mill. Whether they operate those mills as well as Nucor or have good health or environmental practices probably varies dramatically company to company. But 80 percent of their capacity is newer than Nucor's Darlington, Sorth Carolina mill that started in 2001. There are a lot of very new machines in China.

LG: How big a percentage is automotive in steel consumption, worldwide and domestically?

JT: Domestically it probably was near 20 percent and now it's nearer to 15 percent compared to six months ago or a year ago. And worldwide the auto industry is probably only 6 or 7 percent of steel use.

LG: What's the biggest usage of steel?

JT: Non-residential construction is the dominant usage domestically and abroad.

LG: How much bigger is that than automotive?

JT: By more than five-fold worldwide. If in the world automotive is 6 or 7 percent, construction might be 30 or 40 percent of steel usage — worldwide and in the U.S.

LG: Is non-residential construction down dramatically over the last six months?

JT: You should think of construction for steel as four baskets. One is public works infrastructure, a second would be factory or warehouse buildings, the third is residential related or following housing — strip malls, shopping centers, Wal-Marts, Home Depots, houses of worship and places of public assembly. The last would be high-rise, office or apartment buildings. All of those markets are beginning to slow. The residential related, like building Wal-Marts or strip malls, was the only element that was weak a year ago. Now they're all getting weaker.

NG: What about China's steel demand?

JT: China may be having a worse recession than the U.S. It appeared to begin around August. And they may have a bigger property bubble than we do.

LG: What about the numbers that you see of 8 percent growth in China?

JT: If their aluminum output fell 7 percent in October from September, and their steel output in October was 26 percent below the June record, and the country's electricity usage in October was 4 percent less than a year ago, it sounds like they should use their GDP numbers for toilet paper.

NG: Are they going to flood the market with low-price steel?

JT: I think in the modern steel market of 2008 it doesn't matter. Because China's steel output fell 17 percent from a year ago and 26 percent from June, the ingredient prices have collapsed or are in the process of collapsing, and that's destroying the steel price without the Chinese steel ever arriving.

LG: What about specialty steels like stainless?

JT: The price of nickel has fallen from $25 to $4. And chrome is coming down pretty quickly, and other alloys. So a $20 drop in the price of nickel at 160 pounds per ton is $3200 for 304 kitchen sink stainless.

LG: And has this been reflected in the real price in the market?

JT: I sure think so. Nobody buys stainless without looking at the nickel price.

LG: When do you see a rebound in steel prices?

JT: I expect domestic consumption to fall every year, 2007 through 2011. I expect the credit crunch that began in mid 2007 to prevent new projects from being financed and moving along, and cause the capital goods markets to weaken in 2009, 2010 and 2011. I'm expecting that scrap prices rebound $100 to $150. But the U.S. prices have not yet fallen to reflect $100 scrap. So I can't see a rise in the price of steel any time in the next several years.

LG: Is there any period you could compare this with?

JT: There probably were periods before my lifetime. In the world there was a coincident boom for five years. The U.S. market was very strong. Three or four companies controlled U.S. prices and set U.S. prices. There are six antitrust suits filed saying that coordinated production cuts caused the steel prices to be artificially high in the U.S. It doesn't appear to me that steel capacity was in short supply in the U.S., or short enough to warrant the prices that occurred. So there's a lot of bubbles bursting at once right now.

LG: Did you see this coming?

JT: I'm surprised that steel prices stayed high as long as they did. I shorted steel stocks for my own account and lost money two or three years ago. It would be a pretty bad break for someone who's a manufacturer and has steel inventory and all of a sudden the value of the steel falls $500 a ton at a time where he's got to cut the price he's charging for his own product because the economy is in a recession.

LG: How about big automotive. Do they have big stocks of steel?

JT: If they practice just-in-time, and if they're really broke they shouldn't have had big stocks of anything. I think the distributors whose job it is to stockpile, and producers of widgets where the steel content is 50 to 80 percent of the cost of goods sold, are the ones that really suffer. For an automaker the steel might be 3 or 4 percent of the cost of the product. Maybe less than that.

LG: But what about the widget makers who are lean and practicing just-in-time? Are they able to roll with the tide better?

JT: The shorter the duration they have held inventory the more they should sidestep the problem.

LG: Do you think the Obama administration's policies will have a significant impact on steel prices?

JT: I'd be surprised. He may make efforts to support the steel industry and pass a stimulus program that spends a few tens of billions or hundreds of billions on public works construction. But I think that the collapse of the ingredients prices worldwide pretty much pulls the floor out from under steel prices. If the Obama administration causes 10 million tons of steel to get used incrementally in two or three years in the U.S., that's not going to have a big effect on the world steel market.

LG: Thank you very much, John.

FAST COMPANY.

TRUSTY-COOK INCORPORATED

WHEN IT COMES TO SPEED AND PERFORMANCE, EDDIE TROTTA AND THUNDER CYCLE DESIGNS RULE THE ROAD. For Eddie, the results speak for themselves. "Our customers expect only the highest quality, most intricately designed parts on our custom bikes. Trusty-Cook liners allow us to machine these complex parts to meet my standards at speeds that keep up with part demand."

Eddie Trotta

When you need speed and performance in the shop, remember Trusty-Cook Urethane CNC Spindle Liners.

TRUSTY COOK'S PATENTED URETHANE CNC SPINDLE LINERS

Full length round, hex, square, or other irregular shaped inner diameter bores are available for maximum bar control.

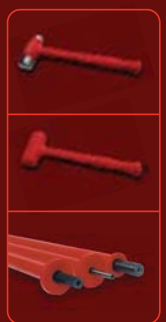
MAXIMIZE MACHINING CONTROL

OUT PERFORMS METAL, NYLON, DELRIN AND OTHER SPINDLE LINER MATERIALS COMMONLY USED

- Increase control
- Increase machining speeds by as much as 30% or more
- Increase profits
- Protect bar stock from marring and scratching
- Minimize machine vibration
- Custom made to fit ANY CNC lathe

SATISFACTION GUARANTEED

For more information on any of our products, or to place an order call or e-mail Jeff.



1.877.240.2462

email-trustycook@sbcglobal.net

End user and dealer distributor inquiry welcome.

10530 E. 59th Street Indianapolis, IN 46236 Ph-317.823.6821 fax-317.823.6822

Maier Power

- 7.5 HP Main and Sub Spindle.
- 2.2 HP on all “Live Tools”.
- 4 turret models to choose from, E series, F1, F2 and F4 series.
- Full “C” axis on all turrets, no need for angle mounting plates.
- “E” series – 16 position turret, “all live”, up to 26 live tool positions.
- “F” series – Up to 3 turrets (F4), 40 tool positions, all “live” capable.
- Up to 4 tools “in the cut” simultaneously.
- 9000 lbs. concrete polymer machine bed, super stable and vibration free.
- Option - Remove guide bushing to work directly from spindle chuck.
- Full 2 year warrantee, machine and control.
- GE Fanuc 31it Control – all options turned on.
- Fanuc “Alpha” series servo motors with .75 G acceleration.
- Mechanical spindle locking – Main and Sub for “heavy milling”.
- Capable of “thread whirling” at high helix angles.
- 18" Headstock Stroke Available.
- Made in Germany.

.

Maier U.S.A 24 Town Forest Road Unit 3 Webster, Ma. 01570 508-671-0055 **www.maierusa.us**

MAIER USA

shop doc

With Noah Graff

Dear Shop Doc,

We are a precision machine shop dealing with a variety of metals. All of our parts must be absolutely clean. We presently have an ultrasonic washer but have struggled with finding the best soap to use with the equipment. What would you suggest?

Clean me up

Dear Clean me up,

As a machine shop you are most likely dealing with removing metal shavings, cutting coolants and/or cutting oils on exterior as well as interior passages. Since you have an ultrasonic unit, I would recommend using an aqueous or water-based cleaning soap. High frequency ultrasonic sound waves create millions of tiny vacuum bubbles that implode on dirty surfaces upon contact. They clean all interior and exterior surfaces and are an excellent cleaning tool for a precision machine shop.

Based on those common contaminants, I'd suggest an alkaline soap. An alkaline soap is any soap that produces a pH in the fluid above 9. This will do a great job of removing the light cutting fluids, dirt and chips you have. But you have to be careful depending on the types of metals. If you are primarily dealing with a variety of stainless steel grades, you have many alternatives and do not need to be terribly concerned about having a soap concentrate that is extremely caustic with a pH level above 12. The stainless can handle this, but it is unnecessary and more problematic for personnel to deal with these highly corrosive fluids.

If you are machining aluminum in the mix of metals you're dealing with, an alkaline soap is still the correct solution but you have to be careful. Aluminum is a very soft metal and is more susceptible to scarring and discoloration in an ultrasonic tank or any immersion tank for that matter. You want to keep your bath pH in the 10-11 range, but no higher. It is also a good idea to use a chemistry that has buffers in it to protect the aluminum surface. The softer the grade of aluminum or the more highly polished the surface is, the more appropriate it is to keep the pH in the 10 or slightly lower range.

If you are machining steel parts, the same alkaline recommendation remains, but you now have to make sure your cleaning soap has a built-in flash rust inhibitor. This will protect the ferrous machined surfaces from rusting once they are cleaned. Most built-in inhibitors are a silicate material and do a fine job. You may notice that on aluminum surfaces the silicate can leave a small haze, which is the rust inhibitor. This may require rinsing the surface off with a hot water rinse or immersion dip. If a soap product with no built-in inhibitors is used, steel parts must then be dipped in a final inhibitor bath.

Frank Pedeflous
Omegasonics

Frank Pedeflous is President of Omegasonics, a manufacturer of ultrasonic cleaning equipment located in Simi Valley, CA. For more information go to www.omegasonics.com.

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 can also check out the TMW online forum at ***www.shopdocforum.com.***

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

A continuing column in which we ask smart people to discuss their views on topics related to the future of manufacturing

BY NOAH GRAFF

next

As gas prices in the U.S. have sunk from over $4 dollars per gallon to under $2 dollars per gallon from August to November, SUV and light truck sales have shown signs of life.

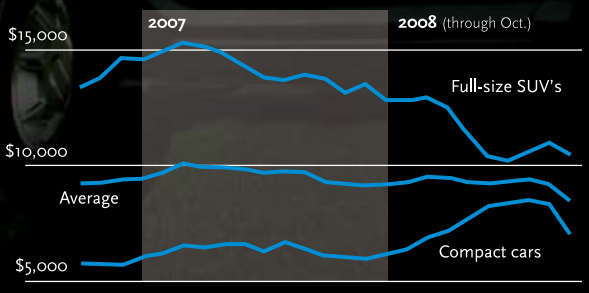
If gas prices in the U.S. remain around $2.00 for the next six months, will a significant number of people start buying light trucks and SUVs again?

I think not! One of the things we know about human nature is that we are largely creatures of habit. Instead of thinking and computing every time what the best thing is for us to do, we usually assume that what we did last time was a good decision and we simply do it again. But if we panic and it appears that we *have to* change, we will. When the price of gas reached $4 a gallon, people finally did panic enough to pause, rethink and revise their approach to cars. But I suspect that the current price drop is not a strong enough reason for us to stop and significantly rethink our approach again. So right now, our behavior won't change that much and the age of smaller more efficient cars is here to stay for a while.

Dan Ariely
Professor of Behavioral Economics
Duke University

the facts:

Although average prices of used, compact cars rose earlier this year as fuel prices jumped, the value of most used vehicles, especially large SUV's, has plunged.



New York Times

Oct. 30, Ford launched a new production plant in Dearborn Michigan to build its new F-150 pickup. It called back 1000 workers and invested $148 million for the plant's new tooling and equipment.

www.ford.com

CSM Worldwide predicts the pickup segment will bottom out at 1.7 million units by 2010. That's down nearly 40 percent from 2007.

CSM Worldwide

History has a habit of repeating itself. Since 1974, consumers have righteously sworn off gas guzzlers following each energy shock, only to re-embrace them like lapsed alcoholics once the shock wears off. With gas prices down almost 60 percent from the mid-summer peak, will it happen again? The answer is a definitive "maybe." There's a boomlet in used light truck sales, right now. No surprise, considering they're going for a song. We're also likely to see demand grow for new trucks as the economy begins to recover, reflecting pent-up demand among commercial buyers and personal users who need the towing and hauling capacity. But SUVs and full-size pickups have lost their faddish luster for most of the market. And, there's the added likelihood that as the economy recovers, the demand for petroleum will soar, here and abroad. As gas prices rise again, it will constrain the revival of the truck market.

Paul Eisenstein
Bureau Chief
The Detroit Bureau

Yes, I do believe a large number of people will go back to buying their oversized, comfortable SUVs. At Gray Auto in Greenfield, Ind., through the summer months when gas was $4.00+ per gallon we pushed just a few SUVs out the door. In November, we already saw an immediate change, with SUVs and large trucks accounting for over 75 percent of our sales. Lets face it, are you more comfortable in your Aveo or your Tahoe? Can you get the same work done in your S-10 or Ranger as your full-size gas guzzling 2500? The answers are simple, and with gas around $2.00 per gallon people are changing their minds as quickly as oil executives can change the price.

Adam J. Renie
Sales Manager
Gray Auto

Automakers are on pace to sell fewer than 11 million vehicles in 2008, about a third fewer than the annual average of the last decade.

More than 70 percent of large pickup truck owners who traded in their vehicles in the first half of November bought large pickups again, according to data compiled by JD Power & Associates' Power Information Network. In May, more than half of those trading in a large pickup left the segment.

Wall Street Journal

Photo courtesy of Dan Ariely.

Interviewed by Noah Graff

Dan Ariely is professor of Behavioral Economics at Duke University. Behavioral economics examines market trends like traditional economics, but distinguishes itself by not assuming that humans always act rationally. The research relies on observing how people behave rather than using traditional economics methods such as cost-benefit analysis.

What is the behavioral economics perspective of the recent stock market crash?

DA: You can think about the recent stock market crash as a good example of the differences between standard and behavioral economics. In standard economics you let people run loose, and because people can optimize and be rational and they do only what's best for themselves, the whole system works very well. In behavioral economics we don't think this is the case. We think that there's a lot of reasons why people make mistakes, and as a consequence they can't be let loose on everything. The free market is not the right approach.

Define "irrational."

DA: When we act in ways that we don't understand or predict. This matters because it gives us an opportunity to get into trouble. If I think that I will have safe sex when the time comes but when I get aroused I don't, it's an opportunity to get into trouble. If I think that I will save for a long time but then I get tempted to buy certain things, that's a problem. If we think that people can compute what is the right amount of mortgage for them to take out that's a problem. If we think like Greenspan said when he testified in front of congress that he thought that people would work in the best interest of their companies, which is clearly not the case, we get into trouble.

Do you believe that because humans are not always rational, there is a need for certain regulations?

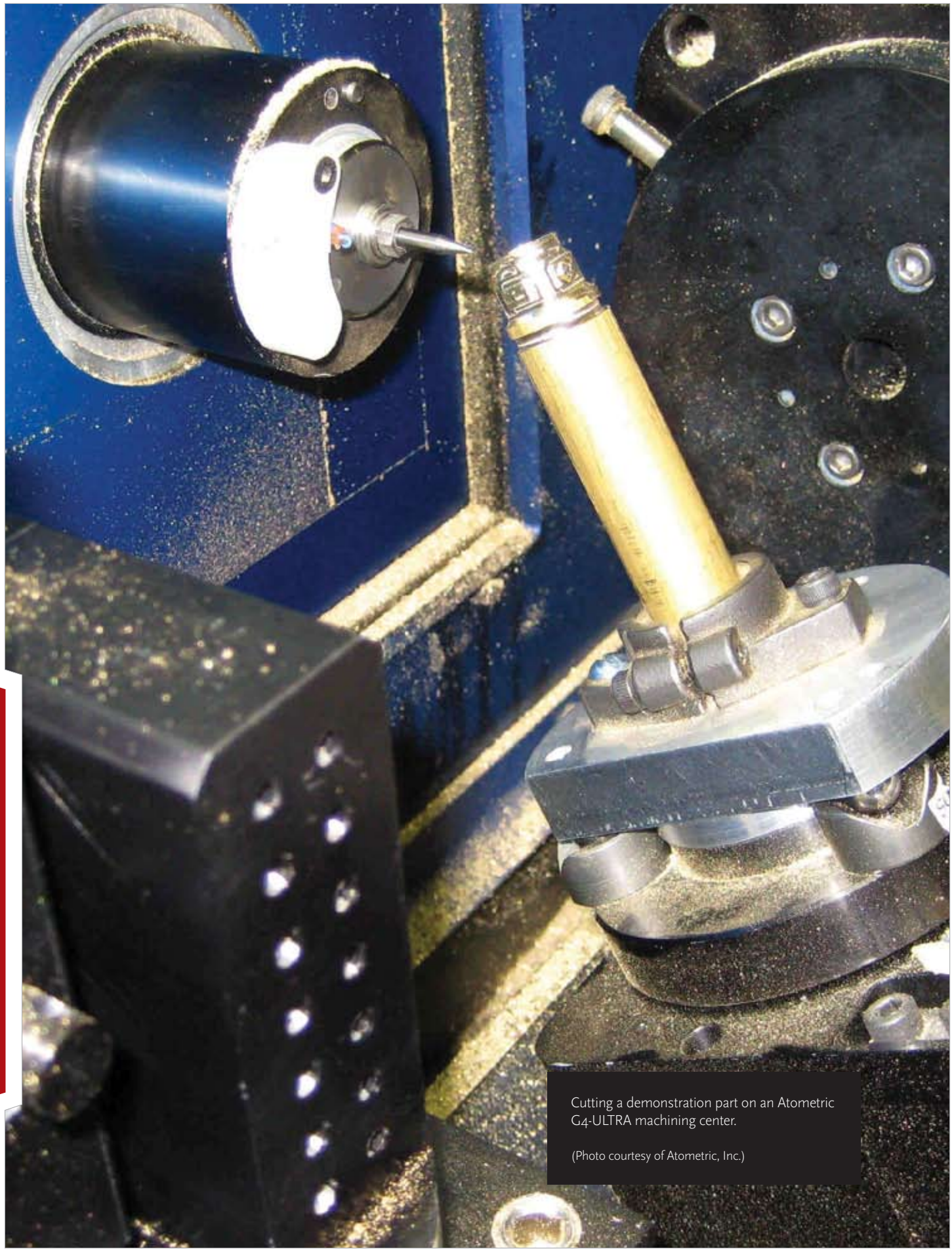
DA: It would be correct for some reasonable regulation. We've done a lot of research showing that even good people, fantastic people, with the best intentions in the world tend to see the world from the perspective of what is good for them financially. In sports when the call is on the edge we always have the tendency to view our team as more correct than someone who prefers the other team. If you have an incentive to view the world from a certain perspective it's very hard for you not to do it. What happened was that people got a ton of money to see the world in a certain perspective.

Does the human impulse to obtain revenge have a big impact on economics?

DA: Yes. Imagine you and I lived 4,000 years ago. There was no police and no law, and one day you stole my donkey. If I was just doing cost-benefit analysis I would say that if you took my donkey and ran far away, it would not be worthwhile for me to chase you. It would take a week for me to chase you and find my donkey, but in less time I could make enough money to buy a new donkey. But if I was the vengeful type, I would chase you to the end of the world to get back the donkey. I will not only take back my donkey, but your kid's donkey. Note there is less chance that you would want to take my donkey to start with. It's not a part of the economic structure, but it helps to maintain order. Yet if you bring this revenge model to the modern world it can become less productive.

How so?

DA: For example, the feeling of revenge people have against Wall Street. We had a social trust. We gave them our mortgages or our retirement plans, and in a very deep way they betrayed our social trust. And now, once this trust is lost, not only are we willing to lose money to get these SOBs to lose more, we have lost a deep trust in the stock market, and unless we fix that trust I don't think things will actually get better. Economists will say it's just liquidity — lets inject more liquidity into the market. As we can see, the liquidity is not really helping. Liquidity is not a bad thing to do, but it's not enough. It doesn't help when there's no trust.



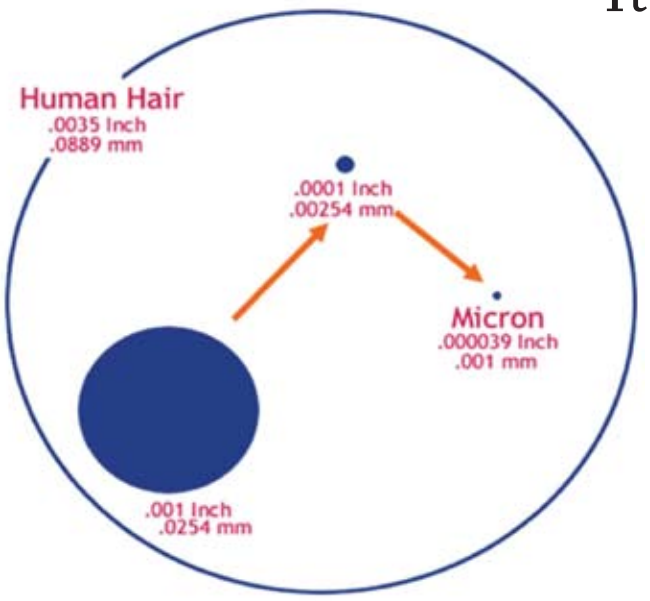
Cutting a demonstration part on an Atometric G4-ULTRA machining center.

(Photo courtesy of Atometric, Inc.)

By Barbara Donohue

Machining Goes Micro

It's still cutting metal, but micromachining presents some unique challenges.



A micron is one-millionth of a meter. That's about 39 millionths of an inch (0.000039"). To put this in perspective, notice in the figure the relative sizes of a human hair (about 0.0035"), one thousandth of an inch, a tenth of an inch, and finally, one micron.

(Graphic courtesy of Atometric, Inc.)

Strictly speaking, "micro" machining could be defined as work on the scale of a micron. However, many in the machining business will say that micromachining is making any very small part with very small features.

One definition says micromachining includes work pieces one centimeter (0.39") or less in size with features of one millimeter (0.039") or less. Another description includes larger workpieces that have small or extremely high-precision features on them. One source says miniature or micromachined parts are those that must be inspected under a microscope. Another says parts made from less than one gram of material qualify as micro.

No matter how you define it, micromachining means small features and tight tolerances.

Micromachined parts can be made from metal or plastic. They're used in many high-tech applications. For example, in a medical instrument, a tiny micromachined gripper can fit inside a blood vessel and remove a sample of tissue for lab analysis.

how it works

"Micromachining is characterized by very small features and tight tolerances," said Andrew Honegger, vice president, Microlution, Inc., Chicago, Ill. "If you're making a feature 100 microns, or 0.004" in size, the tolerance is going to be tight — in single-digits of microns."

Other very small mechanical systems you've probably heard of include MEMS (microelectromechanical systems) and nanotechnology devices. MEMS are typically made up of components in the one-to-100-micron size range, and a MEMS device or system might be up to 1 mm (0.039") in size. MEMS components are usually made by thin-film operations, such as deposition processes, photolithography and etching, rather than machining. Nanotechnology works in the neighborhood of a nanometer, a billionth of a meter (0.000000039"); some nanotech materials, mechanical devices or features are built up one atom or molecule at a time.

Machines for micro

Though you could cut very small parts on a regular CNC machine, you might have trouble maintaining the necessary tolerances, which may be tens of microns or less. A number of manufacturers produce machining centers specifically designed with the rigidity, and vibration and thermal control needed to meet the dimensional and tolerance requirements of micro or miniature parts. Many of these machines offer capabilities and options that tailor them to micromachining applications: Tool changing, tool-tip measurement and offset, optional high-speed spindles, different coolant methods, pallets and built-in measurement systems.

Atometric, Inc., Rockford, Ill., offers the G4-ULTRA, a general-purpose horizontal machining center that can be configured for 3-, 4-, or 5-axis operation. It machines within a work space 100 mm (4 inches) on a side. The machine positions to within a fraction of a micron, and the tool tip is positioned to within a micron. The G4-ULTRA comes with a 100,000 RPM servo spindle as standard equipment and a 200,000 RPM spindle is available. The machine provides

Above: Demonstration piece made on an Atometric G4-ULTRA machining center. For scale, part of a key is shown. (Photo courtesy of Atometric, Inc.)

automatic tool-changing from a 14-position holder. It places the tools directly into the spindle collet to minimize runout, rather than use tool holders. Conductive probing through the tool is available, and this capability can be used for broken tool sensing, as well. An optional confocal laser measuring system can measure conductive or nonconductive workpieces on the machine.

Microlution, Inc., Chicago, Ill., produces a 363-S horizontal 3-axis milling machine, suitable for parts up to two inches on a side that require tools 1/8" diameter or less, said Honegger. A 50,000 RPM spindle is standard, and options include 80,000 and 160,000 RPM spindles. The 363-S also has a 36-pocket automatic tool changer. Positioning is within two microns, and repeatability is within 0.2 microns. The unit's standard software uses G- and M-codes; Microlution can also create custom software for specialized applications. For example, one customer requested to have a camera integrated into the unit for measuring fixtures and parts.

Kern Precision, Inc., Webster, Mass., offers three models of 5-axis-capable machining centers for micromachining. The entry-level Micro system has a 10" x 8.5" x 8" workspace. It provides one-micron positioning accuracy, and ± 2.5 microns achievable part accuracy. The Kern Evo's work space is 12" x 11" x 10"; it has a fully integrated pallet system and a tool changer expandable from 32 up to 95 tools. The Kern Evo provides 500 nm (nanometer) positioning accuracy and ± 2 microns achievable part accuracy. The highest precision unit, the Pyramid Nano, has a work envelope of 20" x 20" x 16", and provides 300 nm positioning and an achievable part accuracy of ± 1 micron. The Micro and Evo models are available with spindles up to 160,000 RPM, and the Pyramid Nano up to 50,000 RPM.

Electrical discharge machining (EDM) has its own micromachines. SmalTec, Lisle, Ill., produces two micro EDM units. The EM203 and GM703 provide three dimensional machining, similar to that done by a CNC machine, but where a very small spark does the material removal. In addition, these units can also machine with conventional cutting tools. The EM203 has a positioning range of 200 mm x 200 mm x 95 mm (7.8" x 7.8" x 3.7"), and provides machining accuracy of 1 micron on 10 mm, and 5 microns on 100 mm. The GM703 has a positioning range of 50 mm x 50 mm x 65 mm (2" x 2" x 2.6"), and provides machining accuracy of 30 nm on 10 mm, and 170 nm on 50 mm.

how it works

Above: A demonstration part made on a Kern machining center, with a ladybug shown for scale. (Photo courtesy of Kern Precision, Inc.)

Below: Parts made on Kern machining center. (Photo courtesy of Kern Precision, Inc.)

Tools the diameter of a human hair

"We often use 100-micron or four-thousandths-diameter tools," said Lindem, president at Atometric, Inc. That's about the diameter of a human hair. It's a challenge making a new part without breaking tools, he said, but then a tool will cut for hours.

Tools 1/16" or 1/32" in diameter, or less, can be considered "micro" tools, said Robert Savage, president of Magafor Precision Cutting Tools, Turners Falls, Mass. His company offers end mills from 0.002" diameter in 0.002" increments, and reamers from 0.008" diameter. A corner-rounding tool is also available for radii of 0.004" and up. To minimize the number of tools required, Magafor offers an eight-function Multi-V tool from 0.020" diameter, which drills, v-grooves, chamfers and performs other operations with a single tool. All the micro tools have 3 mm (1/8") diameter shanks. Hex broaches for cutting driver heads are available 0.051" across the flats and larger, from Hassay-Savage, Magafor's parent company.

RobbJack Corporation, Lincoln, Cal., offers end mills and other tools starting at 0.005" diameter in one-thousandth increments, said Mike MacArthur, applications engineer at RobbJack. If you need an intermediate size, the company can hand-select for diameter down to the nearest 0.0002".

For prototypes and short runs of parts, Atometric uses uncoated carbide tools. Two years ago, coated tools under 0.025" in diameter weren't commercially available, Lindem said. Now, he says, they're available down to 0.010". In production the coated tools run faster and longer, he said.

For certain specific applications, such as precision small diameters in graphite, or thin fins and ribs in plastic injection molds, a diamond coating may be called for, such as the CVD (chemical vapor deposition) diamond coating available from Crystallume, Santa Clara, Cal., a division of RobbJack.

Though you can't see the geometries of a tool's cutting edge without a microscope, they're still important. "People complain about quality and consistency," said MacArthur. "One common thing I see in the marketplace is small diameter tools that don't have any ground primary relief angles." The correct angles and ground relief are important for quality of the cut, he said.

SmalTec micro EDM equipment even allows you to make your own cutting tools. You can call up a special tool-making program and shape the tool in a section of the machine devoted to tool making, using a horizontal wire. "We can shape tools to any angle or diameter or features," said Jerry Mraz, SmalTec's general manager.

Making parts

"Every consideration you have — in fixturing, in coolant, in cutting a part — all the same considerations are in micromachining," said Lindem, "but you have to be prepared that everything acts differently." You'll be able to apply all your knowledge, but often in new ways, he said.

"Traditional feeds and speeds go right out the door" when you're cutting with a very small tool, said Gary Zurek, president/CEO, Kern Precision, Inc., Webster, Mass. "Go to the manufacturer of the cutters and use data from them as a starting point."

"You can run a day's production and have a cup of chips at the end of the day," said Lindem. The chips "look like fairy dust, but under a microscope they look like perfectly formed chips from a big machine." Those tiny chips pose a problem normally not encountered in larger-scale machining. Lindem told of a situation where he would normally use a synthetic coolant. However, he needed to filter the coolant down to the one-micron level to remove those chips. Some of the lubricity components of the synthetic coolant were in the one-to-five-micron size range, he said, so they were filtered out, too.

"Use simpler coolant, misted coolants and oils," said Lindem. "If you're using a tiny tool and putting a lot of heat in a small area, you get coolant effect with misting coolant." Also, be aware, he said, that if you're running an end mill a couple of thousandths in diameter, if you put a stream of coolant on it, you could break it.

Work holding can be a challenge for micro parts, which may be very delicate. "Sometimes we have the drawing and it looks solid," said Lindem. But maybe the raw material is "15-thousandths wire, and it may not have much structural integrity. Not like a cast iron engine block." Try using small versions of standard chucks, vacuum chucks or magnetic chucks. Magnets may work. The manufacturer of your machine can help come up with workholding schemes for challenging workpieces.

Measurement of these small parts can be tricky. They're hard to handle, they need to be fixtured, they may be fragile, and, of course, the tolerances are very, very tight. Many machining centers have contact, conductive or optical probing capability, so you can cut and measure the part without having to handle it. For measurement off the machining center, an optical coordinate measuring machine (CMM) might be a good investment if you're moving into the micromachining business.

Above: Micro channels machined in copper on an Atometric G4-ULTRA machining center. Shown next to a penny, for scale. (Photo courtesy of Atometric, Inc.)

Machining on the micro scale can widen your market in growing industries where the parts are getting smaller, such as medical devices. What it takes is the right equipment and a willingness to learn a new way of working.

For more information:

Atometric, Inc. – www.atometric.com
Crystallume – www.crystallume.com
Kern Precision, Inc. – www.kernprecision.com
Magafor Precision Cutting Tools – www.magaforusa.com
Microlution, Inc. – www.microlution-inc.com
Optical Gaging Products – www.smartscope.com
RobbJack Corporation – www.robjack.com
SmalTec International – www.smaltec.com

Video:

Machining with micro tools; click on video links at bottom of page:
www.sandia.gov/mst/technologies/meso-machining.html

Kyocera micro tools video: http://microvideo.kyoceramicrotools.com/

By Thomas Clouse

Foreign Companies Must Bring More to the Table in China

China's Communist government began its experiment with capitalism in 1978 by opening a small area in southern China to foreign investors. The special economic zone offered preferential taxation policies, inexpensive land and China's cheap and seemingly inexhaustible labor supply. China's then President Deng Xiaoping, well-known for his practicality, proclaimed, "It doesn't matter if a cat is black or white, as long as it catches rats."

The experiment, to follow the metaphor, caught many rats. Foreign money poured in, and pro-growth policies spread across the country as municipal and provincial leaders competed to attract new investment. This foreign investment boosted the national economy to an average growth rate of almost 10 percent during the three decades that followed. The tremendous growth pushed 10 Chinese citizens onto last year's list of the world's billionaires and pulled millions of others out of poverty.

> "Low paying manufacturing jobs can no longer expect the warm reception they once enjoyed."

This year, as China celebrates the 30th anniversary of its opening and reform, its leaders are adjusting their growth centered model. The accomplishments of this approach are clear but so are many of the drawbacks. Income disparity is increasing, the environment is deteriorating and product safety scandals are rampant. The country's heavy dependence on exports has left the economy vulnerable to global economic swings, with recent turmoil in global markets forcing factory closures around the nation. Foreign investment provided fuel for China's economic rise, but domestic demand must eventually step up to sustain it.

For these reasons, policy makers are shifting their priorities toward more balanced, environmentally friendly, safety-conscious and domestically centered economic growth. Recent policies reflect these shifting priorities. China decided last year to unify its corporate income tax code for both foreign and domestic firms at 25 percent, with only a few selected industries, mostly in high tech fields, qualifying for reductions. Previously, foreign firms paid 15 percent, while domestic firms paid 33 percent. A new labor law took effect at the beginning of this year limiting overtime hours, setting minimum wages and guaranteeing severance pay. In October, the government reformed its land policy, allowing farmers to buy and sell land use rights, reducing the power of local governments to secure low cost land for economic development.

Foreign companies cannot afford to ignore this policy shift. China is outgrowing its role as the world's low-cost manufacturing base, and companies need to re-evaluate their strategies accordingly. Higher pay, better employee benefits, environmentally friendly practices, advanced technology, these are the aspects of growth Chinese officials now seek out in foreign companies. Companies that offer low skill, low paying manufacturing jobs can no longer expect the warm reception they once enjoyed.

Some companies, daunted by the changing landscape, are already relocating to nearby markets such as Vietnam, India and Bangladesh. Others have taken strong steps to establish more sustainable practices in China. Wal-Mart is one example. The company gathered Chinese suppliers, government officials, and non-government organizations

"The evolving landscape in China will also open opportunities for companies in high-tech and service industries."

together in October 2008 for a special meeting to outline new company policies demanding that suppliers obey relevant environmental, safety and labor regulations. The retailing giant signed a memorandum of understanding (MOU) with the Ministry of Science and Technology to pursue a number of sustainability goals. The MOU will likely serve as a model for other large foreign corporations that want to gain traction in the Chinese market.

The evolving landscape in China will also open opportunities for companies in high-tech and service industries. Following the lead of neighboring countries such as Japan and Korea, China is setting up special technology parks to attract high tech manufacturers and research and development offices. Such areas can offer well-trained and relatively inexpensive workers for such facilities, and some international companies are taking advantage. Microsoft is currently building a $280 billion R&D center in Beijing, its largest such facility outside of the US.

The companies with the most to gain will be those willing to focus on China's domestic market. The country's service industry is extremely under-developed and policy makers will focus on strengthening this sector as the global economy slows and export growth falls. China's domestic economy shows encouraging signs, with retail sales up 22 percent year on year in the third quarter. The country already has to the world's largest mobile phone market and Internet using population. Opportunities to participate in industries such as telecommunications, health care and education are likely to open. Well-prepared foreign companies can capitalize on those opportunities to join in on the next phase of China's economic miracle.

product focus

The following are companies who have given information on bar feeders.

Bar feeding systems simply feed material into a machine, but their impact on a company's total production can be enormous. Rick Bauer, Edge Technologies' sales and operations manager sums it up, "bar feeders, both short loaders and 12-foot magazine systems, are an affordable and easily deployed tool of automation that effectively increase productivity and unbridle skilled labor for higher value-added tasks. By automatically loading and advancing bar stock in a CNC lathe, manufacturers can produce more parts per shift and run their equipment unmanned or semi-unmanned, thus taking precious labor costs out of their products."

▼ On the Edge

Edge Technologies Introduces the new Patriot 338 and 551 bar feeders, a new advancement in the design and manufacture of economical 12-foot magazine bar feeders for the production turning industry. The Patriot automatically feeds round, square and hexagonal bar stock in lengths up to 12.5 feet into CNC lathes. The Patriot 338 feeds stock in a diameter range of 3 mm to 38 mm and the Patriot 551 in a range of 5 mm to 51 mm. The new design combined with robust heavy gauge structural steel construction gives rigidity, long-term durability and minimizes vibration. The Patriot bar feeders feature a hand-held remote pendant, a touch screen with menu driven parameters selection and memory storage for up to 36 jobs which speeds changeovers. The Patriot's diagnostics and troubleshooting are all run from this same advanced control screen. A reliable Mitsubishi controller and servo drive are mounted on a convenient foldout door panel for easy access.

For more information, please contact Edge Technologies 314-692-8388 or visit www.edgetechnologies.com.

▲ Advanced loading

LNS's line of technologically advanced bar loading and unloading equipment is used for many turning machine applications, from aerospace and medical parts to manufacturing and more. The LNS Alpha Series bar loaders provide reliability, stability and ease of operation when compared to more expensive machines. The Alpha ST 320 feeds round bar stock from .12" to .78" diameter and the Alpha ST 212 is designed to load small diameter, round bar stock from .078" to .47". An exclusive synchronization option is available for use with high-speed sliding headstock machines or when running special materials.

For more information, please contact LNS America at 513-528-5674 or visit www.LNSamerica.com.

▲ CNC Spindle Liners

In addition to maximizing machining performance for round bar stock applications, Trusty Cook's Polyurethane CNC Spindle Liners produce shaped ID's for hex, square, rectangular and irregular shaped extrusions that can solve problems when bar feeding non-round material. These liners reduce vibration, allow for increased machining accuracy and are made of a high performance polyurethane material. They are an alternative to steel spindle liners, are easy-to-install and can be sized to fit any size CNC Lathe.

For more information, please contact Trusty Cook at 317-823-6821 or visit www.trusty-cook.com.

▶ Always Elite

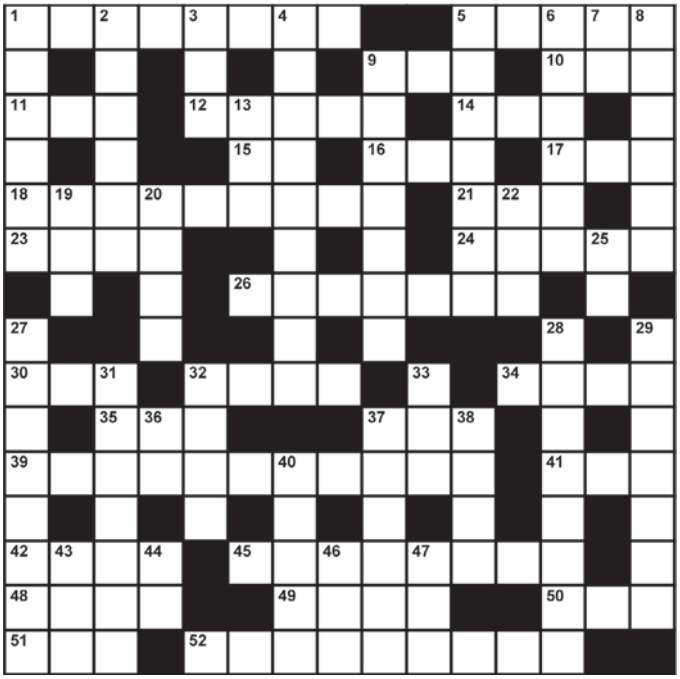
IEMCA's newest bar feeder, the Elite 112, can feed bars for the Swiss applications from .7 mm to 15 mm including lathes with very high spindle RPMs. This IEMCA bar feeder can offer the use of a lift and transfer magazines to enable reliability of bar selection and loading capabilities. The Elite 112 has been engineered with closed, calibrated, round section guide channels and high performance rotating tips. There are no special adjustments necessary when switching jobs, and quick-change guide channels help minimize retooling time. The Elite 112 has ultra low mechanical synchronization inertia to ensure precision following of high acceleration lathe headstocks, including those actuated by linear motors. This feature allows for feeding low bar diameters as well.

For more information, please contact IEMCA at 888-55-IEMCA or visit www.bucci-industries.com.

Send in your answer—quick!
Fax Emily at 708-535-0103, or email
emily@todaysmachiningworld.com

think tank

How well do you know your industry?



ACROSS

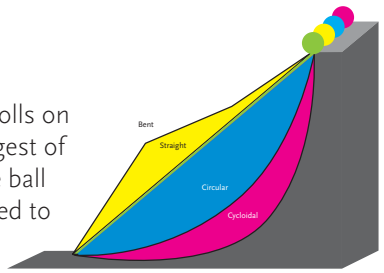
1 Substance used for grinding
5 Smooths and shines a surface
9 Pair
10 Half a chevy car
11 Non-destructive testing abbr.
12 It's often recyclable
14 Lubricate
15 Greensboro location, abbr.
16 Nada!
17 Positive or negative particle
18 Non-crystalline
21 Long, long time
23 Get rid of
24 Debate
26 Machining operation
30 ___ hardness: ability of a cutting tool material to withstand high temperatures at the point of cut without softening or degrading
32 Frame elements that cover workpiece table or spindles
34 Length x width, for a rectangle
35 Alien spacecraft
37 Companies, for short
39 Hardness test
41 Between
42 Any thing
45 Lamellar aggregate of ferrite and cementine in slowly cooled iron-carbon alloys
48 Forward end of an aircraft
49 Otherwise
50 Relative, for short
51 Acquire
52 Type of cast iron created by prolonged annealing

DOWN

1 Soften a metal by heating it to and holding it at a controlled temperature
2 Proportions
3 Metal cutting machine
4 Measure of a fluid's tendency to flow
5 _____ operation: command that allows the addition, subtraction or intersection of solid objects in CAD
6 Rounding off corners
7 Radio wave
8 Form of porous metal
9 Strength shown by the ratio of maximum load to original cross-sectional area
13 Fire residue
19 Back-to-work time (abbr.)
20 Back
22 Comes after dot, sometimes
25 Above
27 Removal of undesirable materials from "loaded" grinding wheels
28 First
29 Workholder for turning that fits inside hollow workpieces
31 Most blunt
32 ____ -squaring bar
33 Apex
36 Iron symbol
37 Unrefined
38 Rig
40 Girder material
43 ___ kick
44 Augusta locale
46 Completely
47 Grassland

Quickest Descent

The shortest path — the straight line — is not the quickest. Instead, the ball that rolls on the cycloidal path will be the first to arrive. Amazingly, the cycloidal path is the longest of the four. The cycloid is called the curve of quickest descent, or brachitochrone. The ball descending the cycloid reaches a high speed early in its descent and uses that speed to race ahead of the others.



Puzzle found in the November 2008 issue

Who rolls the right way?

Steve Moran of Haumiller Engineering Co. in Elgin, IL; **Steve Arora** of National Distribution. Inc. in Farmingdale, NY; **Dan Cronin** of Westover Scientific, Inc. in Mill Creek, WA; **Bob Cookson** of Cookden Industries in N. Andover MA; **Brant Cording** of Great Dane Trailers, T.H. in Terre Haute, IN; **Amith Kalaghatagi** of General Electrodynamics Corp. in Arlington, TX; **Mike Rychcik** of S-R Manufacturing in Schenectady NY; **John Lee** of Keystone Dental, Inc. in Burlington, MA; **Dave Visnic** of Touchstone Research Laboratory in Triadelphia WV; **Drew Larson** of Spektra Mfg. Inc. in Erie, PA; **Rich Omdahl** of Ward Performance in Zimmerman, MN; **Greg Tetrick** of Cass Screw Machine Products in Minneapolis, MN.

postings

Noteable and newsworthy information and events for upcoming months.

Green Manufacturing EXPO

Anaheim, CA

www.devicelink.com/expo

February 10th thru 12th

Anaheim California

Pacific Design & Manufacturing Show

February 10th to the 12th

www.devicelink.com/expo

HOUSTEX 2009

The "pulse" of South Texas manufacturing

Houston Texas

www.sme.org

February 24th to 26th

WESTEC 2009 Exposition

March 30th thru April 2nd

Los Angeles, California

www.sme.org

AmCon San Antonio Show

Contract Manufacturers

San Antonio TEXAS

www.amconshows.com

Feb 17th & 18th

Medical Design and Manufacturing West

February 10th thru 12th

Anaheim, California

www.devicelink.com/expo

Groundhog Day

US, Canada & Switzerland

February 2nd

www.groundhog.org

February 17th

Digital Television

www.fcc.gov

HAPPY BIRTHDAY

Bob Marley

Feb 6th, 1945

http://web.bobmarley.com

calendar

Today's Machining World

You can read *TMW* online before it's even printed!

www.todaysmachiningworld.com

Looking for a forum to get answers quickly to your technical problems?

Go to the *Today's Machinging World* Shop Doc Forum to get answers fast.

Check it out at www.shopdocforum.com

ad index

Today's Machining World

51 ACCUTRAK Link with the pros in knurling and roll forming. Contact us at 800-433-4933 or visit www.accu-trak.com.

4 AMSCO Stocks a large variety of parts and tools for B&S, Davenport, Acme, New Britain and Lipe Bar Feeds. Call 800-832-6726.

12 CHAMPION SCREW MACHINE Your headquarters for tooling and replacement parts. Call 800-727-CSME or visit www.championscrew.com.

47 COMEX Swiss CNC & cam experts. Large stock of automatics, attachments and replacement parts. "Turnkey" including training. AMEA-CEA certified appraisals.

6 DELCAM Find out what Delcam can do for you with their suite of CAD/CAM software. Call 877-DELCAM-1 or visit www.delcam.com.

16-17 DETROIT AUTOMATIC TOOLING World's largest stock of supplies and repair parts for multi-spindle automatics. Visit www.detroitautomatic.com.

30-31 GRAFF-PINKERT Specialists in multi-spindle automatic screw machines and rotary transfers. Call 708-535-2200 or visit www.graffpinkert.com.

9 HURCO A global automation company designing & producing computer controls, software & machine systems. Call 800-634-2416 or visit www.hurco.com.

2 ISCAR Supplier of precision carbide metalworking tools, carbide inserts, end mills and cutting tools. Call 817-258-3200 or visit www.iscar.com.

41 LESTER DETTERBECK Manufacturer of Special Cutting Tools, Tool Blanks, Cams and Tool Holders for the Turned Parts Industry. Call 1-800-533-3328.

38 MAIER Maier Power! Call 509-671-0055 or visit www.maierusa.com for more information on Maier's machines.

64 MARUBENI CITIZEN-CINCOM, INC. A joint venture company — Marubeni Tokyo & Citizen Watch Co., Ltd., builder of precision Swiss-type lathes.

63 MIYANO Building the best turning centers in the industry. Call 630-766-4141 or visit www.miyano-usa.com.

3 NEXTURN - TYLER MACHINE COMPANY The CNC Swiss machine leader. Call 603-474-7692 or visit www.tylermachine.com.

47 SOMMA TOOL Broaches, dovetails, hollow mills, quick-change insert tooling and more. Experience honest-to-goodness service. Visit www.sommatools.com.

41 SLATER TOOLS The broaching experts. Call 586-465-5000 or visit www.slatertools.com.

51 & 56 TODAY'S MACHINING WORLD Visit www.todaysmachiningworld.com for online Swarf, additional product news, videos and more.

37 TRUSTY COOK Maximize machining control with patented urthane CNC spindle liners. Call 877-240-2462 or visit www.unist.com.

sales & service

GRAFF-PINKERT, INC.

Your ONE-STOP source for
Wickman repair, attachment and tooling needs.

HUGE inventory on our Oak Forest, IL floor!

Over $1,000,000 new and used IN STOCK
for immediate delivery.

NO IMPORT DUTIES

NO OVERSEAS FREIGHT BILLS

NO CHARGE FOR TECHNICAL PHONE SUPPORT.

Need it next day? NO problem!

Contact Cathy, Carol, Greg or Manny!

708-535-2200 parts@graffpinkert.com

sales & service

help wanted

help wanted

sales & service

Noise, Splash, & Chip Control Machine Enclosures

(((NOISE-TAMER)))

Screw Machine Enclosures

TAMER INDUSTRIES

185 Riverside Avenue
Somerset, MA. 02725
508-677-0900
www.tamerind.com

GANESH MACHINERY

Mills • Lathes • Turning
and Machining Centers

888-542-6374
www.ganeshmachinery.com

Polyurethane
CNC Lathe Spindle Liners
Maximize Machining Control
10530 E. 59th Street
Indianapolis, IN 46236
Ph: 317.823.6821 • Fax: 317.823.6822
Toll Free: 877.240.2462

Visit us on the internet at
www.trusty-cook.com
email: trustycook@sbcglobal.net

TRUSTY-COOK INCORPORATED

Highest Quality Precision Cutting Tools

Reamers/Drills • Thread Mills
Thread Whirl Inserts
Dovetail Forms, Shaves, Flatforms
All Special Form Tools • Quick Quotes
Carbide, HSS, Ceramet
Tool Design Service and Engineering
Tight Tolerances
Micro-Medical Tooling

www.completool.com
www.completetool.net
email: info@completool.com
763.571.4242 • Fax: 763.571.4406
7760 Elm Street N.E.
Minneapolis, MN 55432

Quality • Service • Value

Complete Tool Grinding

www.greentechnologies.biz

Non-marring Feed Fingers & Pushers
for All Automatic Screw Machines

GREEN Since 1942

815.624.8011
Green Technologies, Inc.

NEW CATALOG NEW PRODUCTS

Engraving Tools, Profile, Miniature and Back Chamfer Boring Bars. BSPT/BSPP, UNJ External Thread Mills, Face & Undercut Grooving Tools, Acme & Stub Acme Internal Threading Tools.
SCIENTIFIC CUTTING TOOLS, INC.
110 W. Easy Street / Simi Valley, CA 93065 /
800-383-2244 / 805-584-9629 [fax] info@sct-usa.com /
www.sct-usa.com

VARLAND METAL SERVICE, INC.
Electroplating Specialists since 1946
www.varland.com
513.861.0555 • FAX 513.961.7017
3231 Fredonia Ave. • Cincinnati, OH 45229

High Volume Swiss Turning
Phone: 401-263-1958
Fax: 401-231-1628
email: precisionturn@aol.com
WWW.PRECISIONTURN.COM

hardingetooling.com
- COLLETS
- FEED FINGERS
- PADS
- ROTARY SYSTEMS

Mini-Skimmer™ Oil Skimmers
Remove Tramp Oils From Coolant!

Wayne Products Inc.
Web: www.wayneproducts.com
Email: info@wayneproducts.com

afterthought

Nothing to fear

"The only thing we have to fear is fear itself." This sentence, uttered by President Franklin Roosevelt in his first inauguration speech in 1933, is probably the most memorable phrase said by an American president. It is in vogue today because of the rampant fear of national and personal economic collapse. I have often thought about the Roosevelt quote but seldom used it myself because I doubted its truth and usefulness. I saw it as an oratorical contrivance used by a clever president to reassure a country passing through economic depression to World War II.

"People are social beings who care about what their peers believe."

The people listening on the radio to FDR in 1933 had a lot to fear — poverty, homelessness, hunger, families breaking apart. Read John Steinbeck to get a sense of the despair in the country in the 1930s.

For me, the Roosevelt statement connects not so much on unemployment statistics and Dow Jones gyrations. My biggest personal fears have always been about my health and my family. My experience with my own heart failure and hospitalization have in an odd way made me less fearful. When I was having a heart attack and awaiting heart surgery I was less fearful than I had been when I was living through years of angina symptoms I had wanted to ignore, but couldn't. When the worst of my fears was being realized I felt both confident and powerless.

From the vantage point of a business owner, fear seems to be as much about the prospect of making bad decisions as feeling impotent to change the course of the ship.

Andy Grove, one of the three founders of Intel Corporation, wrote a book in which he extolled fear, entitled *Only the Paranoid Survive*. Grove's thesis was that business managers need to be constantly fearful that the competition will sneak up on their company or that technological change will overwhelm the firm. He felt that worry channeled into thoughtful action was the catalyst for his success at Intel.

We have seen another twist on the Roosevelt dictum this year as negative stock pickers, the "Bears," have fomented fear in stock and bond markets across the planet to make billions of dollars on short selling and put options. The cynical Bears have attempted and often succeeded in jump starting runs on companies like AIG, Citibank and Lehman Brothers, causing incredible financial damage that did not have to happen. The access to financial gibberish on the cable TV networks amplified the panic in the market enabling the Bears to make a fortune.

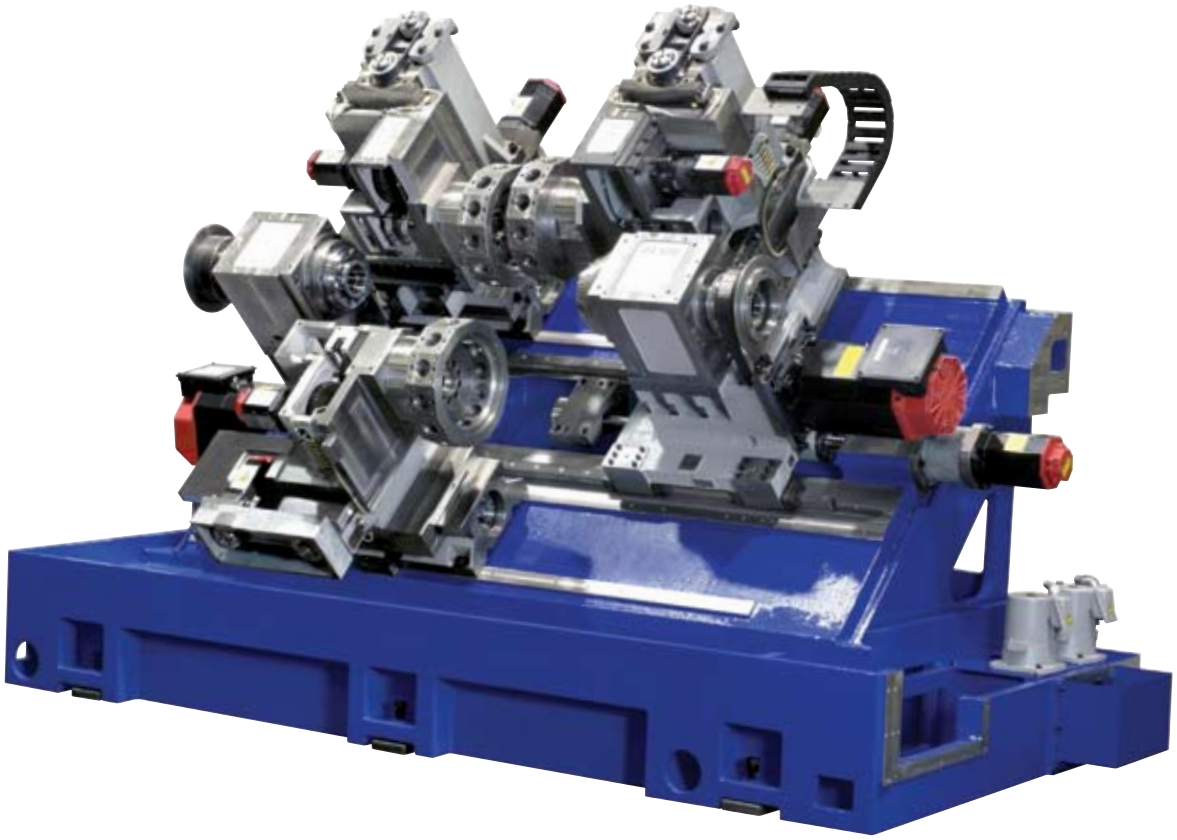
The Bears are now having fun with GM and Ford with the help of senators representing southern states with big transplant auto plants.

Behavioral psychologists have long studied herd behavior. People are social beings who care about what their peers believe. The behavior of crowds has spawned a cottage industry of market "technicians" who quantify the buying and selling patterns of investors, trying to discern some predictable patterns. I have always regarded "technical chart analysis" as Wall Street voodoo, but in its broad sweeps it does record the sheep mentality that spawns market euphoria and market despondency.

The great investors like Bernard Baruch and Warren Buffet understood fear and made fortunes taking advantage of markets' overreactions. To them "all we have to fear is fear itself" was part of the constant search for a "buy" signal. Great investors and business people understand fear, including their own, but can step outside themselves and crowds to see where opportunity lies. The contrarian opinion will usually be right "eventually," but most business people lack the patience or a big enough bank account to sweat out long periods of personal and market despair.

Lloyd Graff

PRINCIPLES OF PROFITABILITY



BEEFY CASTINGS LEAD TO BEEFY PROFITS

PRINCIPLE

47

Our machines' legendary precision and productivity start with the heaviest castings in their class. All of that cast iron allows Miyano's turning centers to handle the rigors of running twelve-foot bar stock at high RPM. Longer bar stock means reduced bar change times, less end scrap and more profits in your pocket.

Miyano
ABX-64TH2

HOW TO MAKE MONEY IN MACHINING

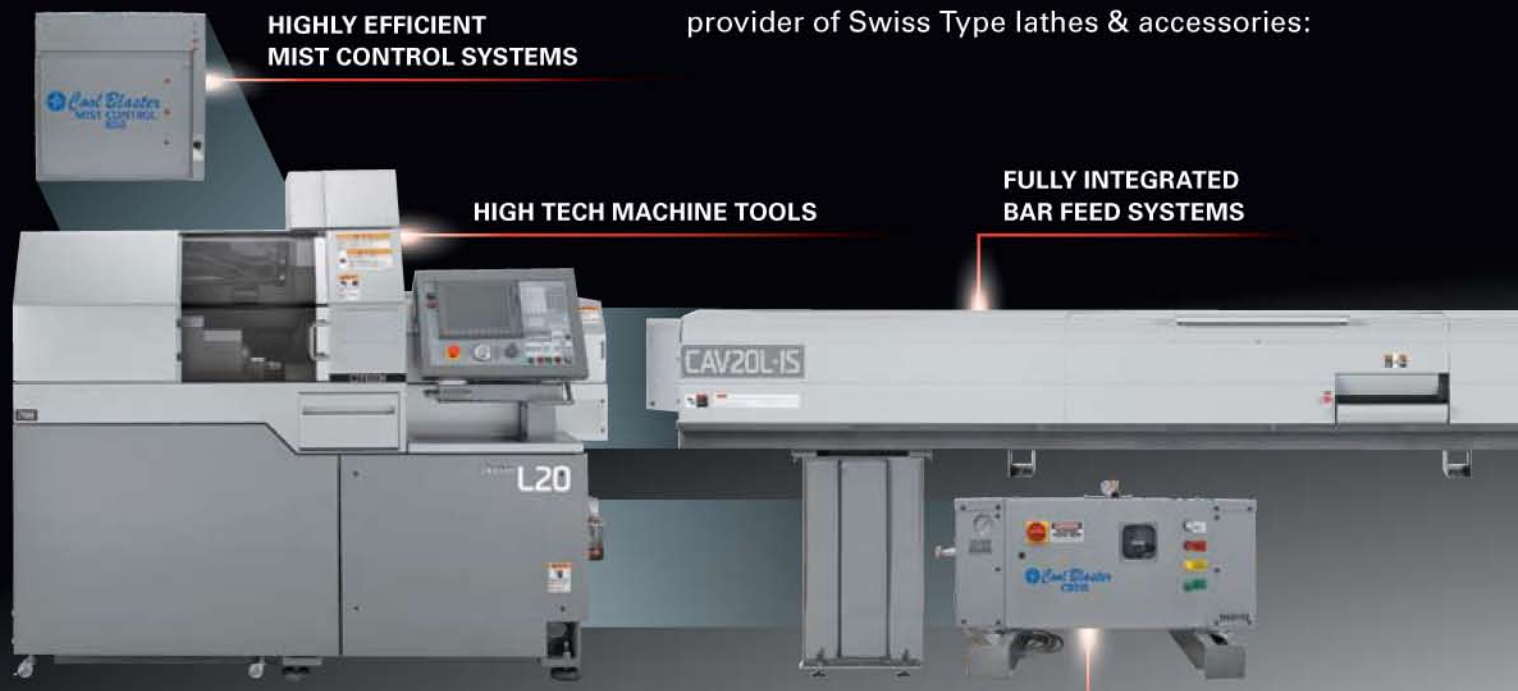
If making money is on your to-do list, give Miyano a call today. Our team has the tools and know-how to squeeze the maximum profitability out of your turning applications.

Miyano
The World Leader in Precision

For more information:
Tel - 630-616-6041 Fax - 630-616-6025
Web www.miyano-usa.com

CINCOM ADVANTAGE Technology
CINCOM ADVANTAGE Support
CINCOM ADVANTAGE Financing

Marubeni Citizen-Cincom is your single source provider of Swiss Type lathes & accessories:



One contact for purchasing, financing and support.

Citizen machines and these accessories are exclusive products provided by Marubeni Citizen-Cincom and Citizen Machinery America. Financing provided by MCC Capital.

Cincom

www.marucit.com

Marubeni Citizen-Cincom Inc.

Contact Marubeni Citizen-Cincom or your local Citizen distributor and learn more about the **CINCOM ADVANTAGE**

Allendale, NJ
(201) 818-0100

Elk Grove Village, IL
(847) 364-9060

Fountain Valley, CA
(714) 434-6224