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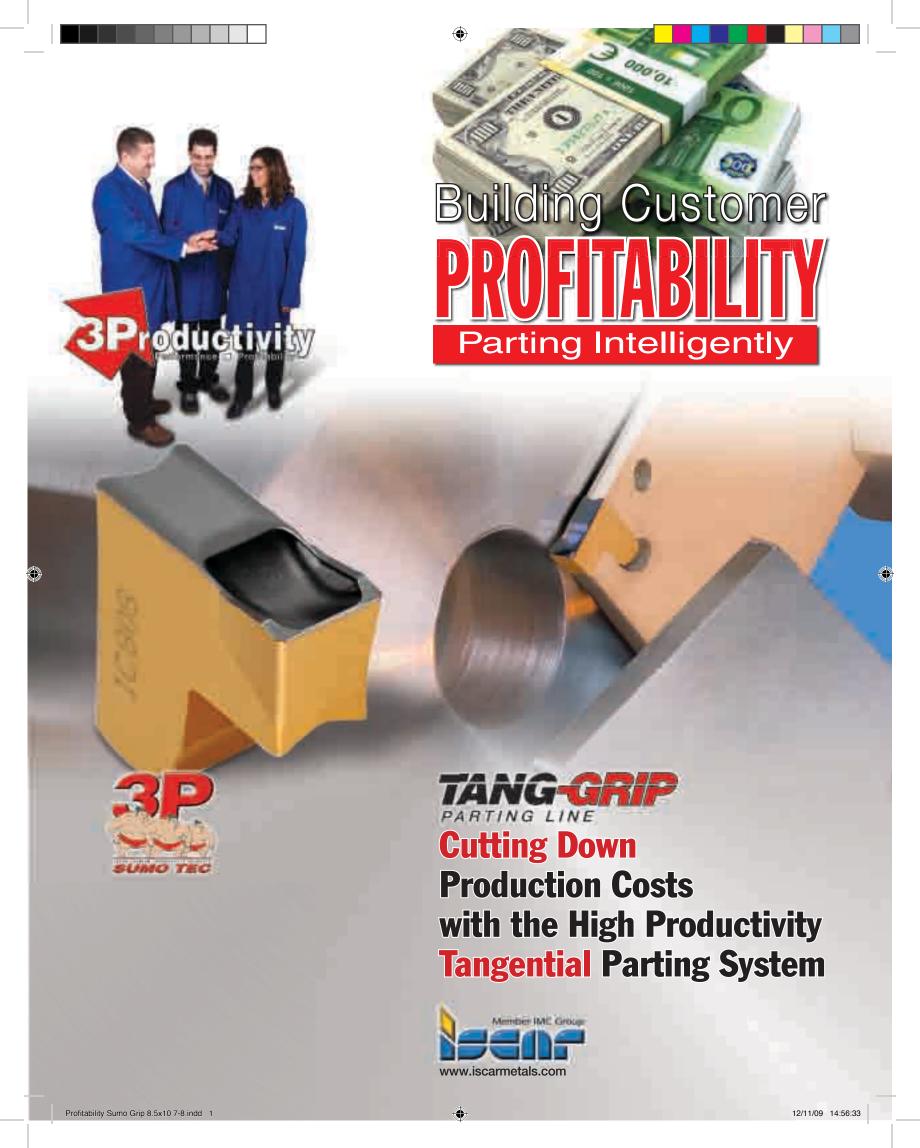
# Today's Machining World

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How a Small Machine Company Built a Brand

November/December 2009 volume 5 iss

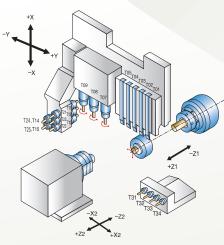
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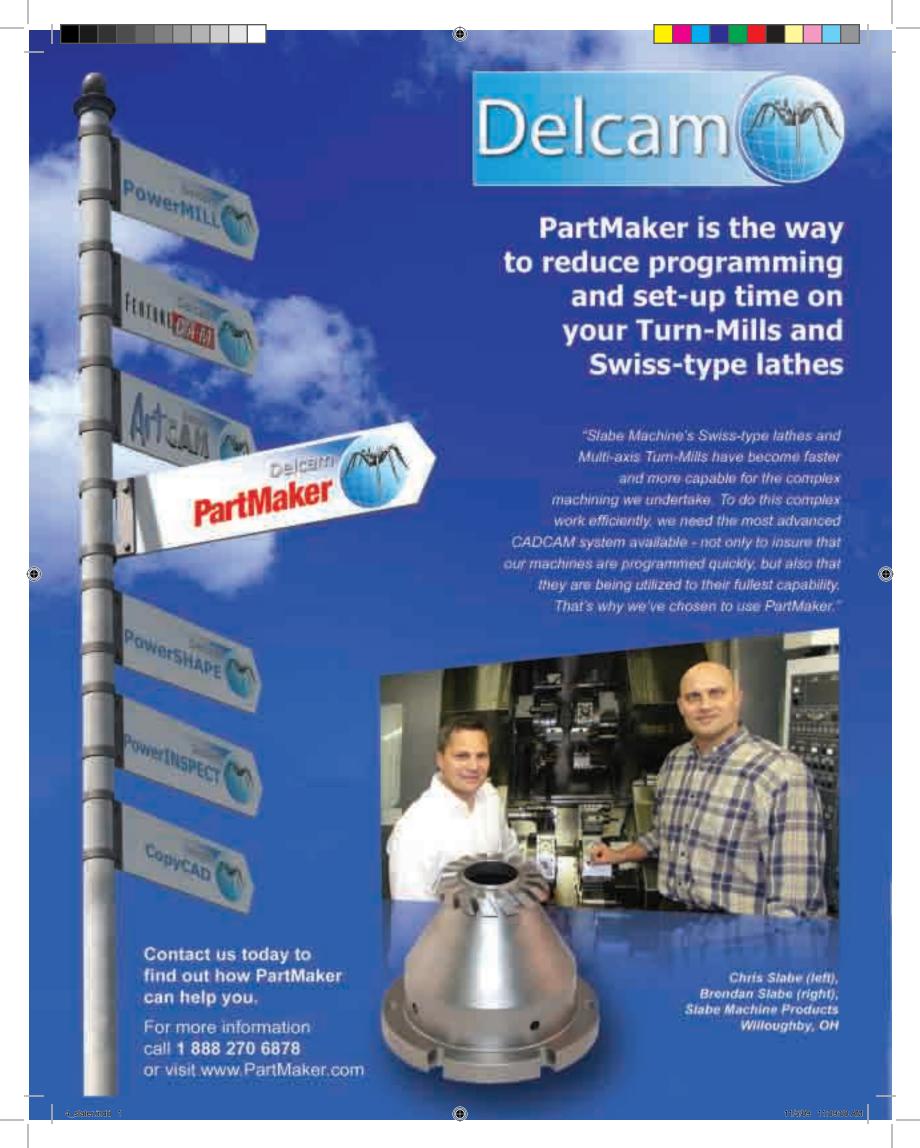
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Check out Today's Machining World's New Web site at: www.todaysmachiningworld.com

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# editor's note

#### Have a Little Faith

iust finished reading a wonderful new book by Mitch ▲ Albom called Have a Little Faith.

I have been a fan of Albom since he wrote sports for the Detroit Free Press and made his weekly appearance on ESPN's "The Sportswriters" program on Sunday mornings.

Albom doesn't do much sports writing now. Since his book Tuesdays with Morrie, in which he recounted his days spent with his beloved professor who was dying of ALS, he has been focused on writing books and doing charitable work.

Mitch Albom has an amazing gift of listening to stories and recounting them simply and cleanly to his readers. I cannot read an Albom book without crying. Of course, I can't watch Jimmy Stewart in "It's a Wonderful Life" without crying either, even though I've seen it 50 times.

I recently talked to an advertiser of Today's Machining World who told me he was disappointed in the magazine because we weren't "technical enough." I told him to look at the "How it Works," "Shop Doc," "Fresh Stuff" and "Product Focus" features. Then I told him that at its heart, TMW is about the stories of people who work in the world of machining.

Readers love this magazine because it's core is the stories of real people.

As we enter the holiday season I hope you read Mitch Albom's book—and our magazine, blogs and new Web site. And in this chasm of economic and emotional depression we live in, Have a Little Faith.

> Lloyd Graff Editor/Owner

November/December 2009

#### igoplus

# Technology that pays for your investment.

What if you could reduce setup time from 5 hrs 30 minutes to 1 hr 30 minutes? What if you could reduce total operations from 7 to 2? Those are the results of our 3-axis versus 5-axis Time Study. Contact us today to see how the VM10U can increase productivity and profitability at your shop.





NOVEMBER/DECEMBER TALENT POOL

# contributors



Lloyd Graff started Today's Machining World in 2000 to serve the precision parts community. His love of good journalism started with reading the work of great sportswriters like Jim Murray and Jimmy Breslin. He honed his interest in writing as a sports editor and columnist for University of Michigan's The Michigan Daily. His love for the machining business started with being regaled by his father Leonard Graff and uncle Aaron Pinkert with stories about deals and characters out of their business careers. Lloyd's view of magazine writing is that its core should be important ideas illuminated by real human stories.



**Noah Graff** has been working at *Today's Machining World* since 2005. He is the features editor, videographer, and "the Web guy" of the magazine. He graduated from the University of Wisconsin majoring in film and history. He currently has a reality show on YouTube called "Jew Complete Me" documenting his search to find the Jewish love of his life. He loves Michael Jackson (his music) and is by far the best salsa dancer on the *TMW* staff. Favorite quote: "Try not. Do or do not, there is no try." *Yoda*.



Barbara Donohue has been turning technology into English since 1993. An MIT-educated mechanical engineer with more than a decade of industrial experience, she started her career in journalism as editor of a small-town weekly newspaper. She regularly contributes "How It Works" articles to *TMW* and loves that it gives her an excuse to research different technologies and visit machine shops and factories wherever she goes. When she's not writing, Barbara likes to take her therapy dog, Luke, to visit patients in nursing homes and hospitals.



Larry Clayman When not listening to jazz, drinking red wine (for medicinal purposes only), enjoying every flavor of pop culture or reading *Today*'s *Machining World*, Larry Clayman runs Clayman Advertising, an Akron, Ohio-based marketing communications company. Celebrating its 55th year in business, the agency, now in its third generation, is working day and night to adapt to the new age of marketing—hello social media. Having grown up in northeast Ohio, Larry has endured 45 years (and counting) of non-championship professional sports. His hope is that LeBron James and Shaquille O'Neal will help bring that draught to an end this year.

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# forum

In the September/October 2009 issue's Swarf column Lloyd Graff asked what the term "Chicago screw" meant to readers, and also if anyone could help Doreen Koop make them. Here are some of the responses. Visit www.swarfblog.com to comment yourself.

#### Horseman

To a horseman a "Chicago screw" is what holds the bit to the bridle. It is a two-piece fastener that has a normal screw on one side with male threads and a tubular rivet with threads on the inside, on the other side. When put together they are perfect for joining a loop of leather together to hold onto the bit.

Glenn Trombley

#### Chicago Screw Up

I heard the term "Chicago bolt" about 20 years ago in the custom machine building business. I don't think we ever actually used them; it was just part of the badgering someone would receive if they made a part incorrectly and it didn't fit.

Steve Miller's description matches my idea of a "Chicago bolt."

Mark Bos

If you were Doreen Koop in need of a Chicago screw,

which of these companies would you choose?

#### Postman

They are also known as "Chicago post screws," and are used to hold together binders or albums. One manufacturer is Accurate Manufactured Products in Indianapolis.

Marc Freidus

#### Family Owned

I believe we can help Doreen Koop with her need for stainless steel fasteners. We are a family owned and operated screw machine and CNC lathe job shop with over 60 years of experience. We have served a multitude of industries and machine all types of materials. Our competitive range runs from just a few hundred pieces to thousands.

I look forward to be working with Doreen.

Steven Douglas Apex Machine Products, Inc.

#### What Bolts?

These are also known commonly in the screw machine world as sex bolts. There are a variety of types. Best of luck finding those that are made in the U.S. The last time I made any was before the Bush administration.

Larry A.

#### A Real "Chicago Screw"

Don't put enough money into the parking meter in downtown Chicago and you'll find out what a "Chicago screw" is.

Joe Braun

#### "Chicago Fastener"

I have never heard of a "Chicago screw" but am familiar with the phrase "Chicago a fastener," usually a bolt. This is done to compensate for the misalignment between a drilled hole and a corresponding drilled and tapped hole by connecting two pieces of metal with a bolt. Rather than elongate one of the holes to correct the misalignment, the diameter, or upper part of the bolt is ground to a slightly smaller size to compensate for the two holes not exactly lining up.

Steve Miller



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 @todays machining world.com or lloyd @todays machining world.com

#### Chase Us

I read in your latest issue about Doreen Koop's desire to find good American made fasteners. Look no further than Penn Engineering and Manufacturing. We have been making fasteners for decades now and would be glad to provide a quote. We have facilities worldwide, but our Winston-Salem, N.C. plant specializes in screw machined fasteners, which would be a good fit, and we are located nearby. Please visit our Web site www.pemnet.com.



Rick Bafford Manufacturing Engineer PennEngineering

#### **Specials**

I read the article about Doreen Koop in your magazine wanting a supplier for American-made fasteners. We manufacture many kinds of "specials" and would like the opportunity to see the particulars on this one. Please forward this and we will certainly make our best efforts to qualify. We work with formal prints or simple sketches and currently have open machine time.

National Cap & Set Screw Co.

#### Know the Industry

We would be happy to help with [Doreen's] requirements for stainless steel fasteners. Our Web site is www.burdmanufacturing.com. We make components for appliance manufacturers so are comfortable in the industry. I look forward to hearing from her.

Bill Daugherty President BURD Manufacturing



# "Paradigm Shift"



# **For Precision Machining**



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# swarf

BY LLOYD GRAFF

Below: Arby Eight LG



## Oprah and the Acme

ear Oprah,
I am a fan of yours. I've been watching your show since before you were the Color Purple. You've had Nobel Prize winners, cancer doctors, dessert chefs and exercise mavens, but you've never had anybody remotely like me tell their story. Perhaps after you read my take you will invite me to be a guest.

My name is Arby Eight. I am a National Acme screw machine and damn proud of it—for the last 51 years! My story is the story of North American industry and today I'm feeling !@\$#%# unappreciated.

I started my productive life in 1968 when I was shipped from my birthplace in Cleveland to an ammunition plant near Minneapolis. Without any training or initiation they heaved me into a line with 30 guys just like me and started shoving leaded steel bars through me making fuze parts for big artillery shells that were lobbed into the Vietnamese jungle to kill people in black pajamas. They called them "gooks" then—at least that's what I discerned by listening to the operators, most of whom knew Americans in "Nam" and wanted no part in fighting the war themselves.

After that conflict settled down, I sat idle for a while. Business in the early 1970s was crappy, but then the oil boom came along and I started making sucker rod fittings for an outfit in Texas, 'til that bubble petered

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November/December 2009

# swarf

out. Them ol' boys in Dallas didn't know anything about multi spindles like me, but I did learn to like Mexican food while I was in that factory.

The sucker rod play went away in the 1980s when gas sold for \$.70 a gallon. I was sold at auction like a big piece of meat to a fittings company doing work for the farmers. That gig was okay for a while, but then the farmers stopped buying because \$2 per bushel corn did not buy many tractors.

From there I gravitated to a job shop in Detroit that did work for the Big Three automakers. What a miserable time. They ran me like a slave and poisoned me with sickening soluble oil that made a mess out of my innards. They even mixed the coolant and lube oils. We all knew they were milking the place, looking for a holding company to buy them out, roll it up and go public. They never found a buyer, so me and the rest of the machines got old and arthritic.

The guys in the shop talked among themselves about the lunacy of the management. The founder of the company had retired and the family kept bringing in "professional" managers and accountants who said, "forget about the machines—use the shop as a cash cow." The floors were slick and air was misty. What a dump.

And they never diversified into non-automotive work, so when American cars stopped selling all they knew was to lay off people and skimp on maintenance.

Oprah, I'm writing to you for the Class of 1968 National Acme crew that hit the shop floor running. We ran quality then. Now we sit idle, not because we can't still cut it, but because the world changed. The owners got old and their kids became doctors and chefs and dropouts. The accountants viewed what we did as "input" not craftsmanship and artistry.

A very small handful of my compatriots moved to China and Mexico, but most of us are here rusting, and a few have even melted away.

I know of a few RB8s who are still running next to some sexy CNC Swiss machines, but most of us just sit and wait for the car companies to start making cars people can afford and want to buy.

Oprah, I'm not anything that special myself, but my story is the story of 50 years of American manufacturing and the

contribution we still make to this country. Your audience may think I'm already dead, but my lifespan is limited only by the availability of spare parts, the creativity of rebuilders and the ingenuity of the people who enable me to do what I do well.

The duopoly of of Chase and Mueller Brass is anti-competitive and hurtful to successful production of brass components in America. The stranglehold has been deftly handled by the two brass bar producers. They keep prices in line to discourage the big capital investment it would take for another competitor to start up. Their control of the scrap market makes it almost impossible for a foreign brass maker to compete without an American mill. Whenever I ask a brass components maker why they don't buy foreign material, the one word reply is "scrap." Even if you could buy brass bars at a discount from China, Europe or India, you still have to sell brass scrap at the spot price. This presents unacceptable risk. This is why brass cannot be equated with stainless steel, where we have seen significant challenges to Carpenter.

Perhaps the Obama administration will examine the brass duopoly, but I doubt it because the political world seems to ignore it. Chase and Mueller are still attentive to their customers and recognize they have to help keep their clients healthy. My sense is that manufacturers gripe a lot, but accept the duopoly like health insurance, a pain you have to live with.

Greg Mulins is a "glue person." He is one of the thousands of skilled vagabonds who hit the road every day so the modern world holds together.

Greg's specialty is 10- to 20-year-old semiconductor-making machinery, particularly equipment made by GCA Corporation, which is out of business now. It is still found in a lot of defense industry plants and military bases.

Greg is well paid. His services sell for \$275 per hour, plus travel. He also earns a healthy per diem, which eases the pain of constant travel. He has been in the field since

1980 and possesses that combination of experience and tenacity that makes him well worth the money to companies with breakdowns. He works for a small company named RZ Enterprises, which makes a market in used machinery in this arcane field and offers turnkey packages for special projects.

So when the Fanuc serviceman wants \$145 per hour to reprogram your CNC control whose memory just had a senior moment, do not fret too much. You are paying for the crucial intellectual property that keeps things running in our dumb technological world.

The "glue people" give us insight into the way business works today. The hamburger maker at McDonald's is worth \$8 per hour. The CNC operator might get \$15 and the shop foreman \$25. But the person or firm with the real pricing power knows the secret codes, owns and understands the wiring diagrams and has the experience to diagnose problems across several specialties. Does this tell you something about how you run your business?

Ford made a billion dollars last quarter and gained market share. They have \$23 billion in cash. GM gained market share in the quarter. Toyota made money in the quarter after predicting a loss. Automotiveland is producing at the rate of 10.5 million units per year and making some money. At 12 million they will feel good. The emasculated supply base will need to rebuild capacity—hopefully sooner than later.

I rarely find a Web site for a machining company that would influence me to buy from them. Most Web sites I've seen are mediocre brochures reproduced on the Internet. The challenge on the Web is to differentiate what you do from the guy down the street or across the country. I am amused when the centerpiece of a Web site is a recitation of machines in the shop.

If I have a part to be produced, I care about quality, delivery, price and my customer experience. Web sites that can convey

a sense of the people I'm going to deal with, either by video or some other personalized approach, have a chance to move the ball. I recently viewed a video tour with Dr. Gerald Niznick of Implant Direct, a Calabasas, Cal., dental implant manufacturer, that raised the bar for branding videos in the machining field. Check it out at www.implantdirect.com.

The feature story in this magazine about the effort by Bothe Associates to develop a unique consumer product in their Kenosha, Wis., plant is a story about branding, manufacturing, developing a buzz and family involvement.

The Bothes sell their Signature Needle Arts knitting needles of superior quality and appearance at 10 times what the generic Chinese product sells for at Wal-Mart. Most of their selling is Web-based.

The 59-year-old machining firm has dozens of high quality CNC machines, many idle in the recession.

After seeing the success of their knitting-network marketing, Cathy Bothe, head of Signature decided to email her list of needle customers to see if they had connections in the machining world. The results were positive. Several people got back to her with suggestions for new accounts.

We are all a part of networks that overlap our business, but we usually define our world so narrowly that we neglect real opportunities. Why not have a brainstorming session in your company to find networks you can connect with?

#### Productivity in manufacturing rose

an unprecedented 13.5 percent in the third quarter. It means business is rising but the number of employees isn't. The inflation vigilantes do not accept these numbers. But I'm feeling groovy about productivity gains, which will give a big chill to the dollar killers and gold hoarders. Sell your bullion unless you're going to make soup.

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## swarf

The New York Yankees' Mariano Rivera, at 40 years old, is still the best relief pitcher in Major League Baseball, and the greatest of all time.

Rivera throws one pitch—the cut fastball—a pitch of 93 miles per hour with a small break in it. His superiority derives from amazing accuracy, excellent ball movement and the appearance of total confidence that he will succeed in saving the game. Each time he is called by Manager Joe Girardi, everybody in the stadium thinks the game is over. This aura of invincibility may be his single most powerful tool.

Rivera is occasionally beaten, but he never seems to

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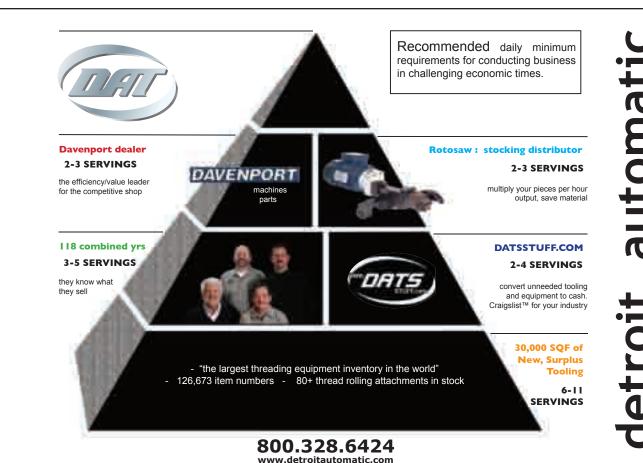
I think in business we want to have a large repertoire of weapons. Perhaps, what Mariano Rivera shows us in every

appearance is that we only need one great pitch and an unshakable belief that we will win.

# Marshall Manufacturing's biggest client, Sun Hydraulics, told the owners of the company that

they wanted Marshall to run their work on the latest and best Swiss CNC lathes.

Marshall, a conventional screw machine shop in Tennessee and Florida, had been hurting in recent years and the owners were beaten up. They felt they were running the components competitively as they were and chose not to invest over a million bucks in Citizens or Stars.



Sun was true to their word and moved the work to a shop in Chicago that was willing to make the investment to acquire the work. Marshall chose to auction off their machinery after the Sun work went away.

Everytime I touch Sol, he is farther away.

My father-in-law, Sol Levine, suffers from dementia and a form of Parkinsons that has diminished him to an almost mute, barely mobile, observer of life.

I feel sad seeing him diapered, mumbling and humming as he shuffles, leaning over his walker. Eighty-eight years old, dying inch-by-inch, day-by-day. The doctors say that his brain

lobes have deteriorated along with his ability to speak, but he knows his family and probably can still beat everybody at checkers.

I look at him and will him to talk to me or walk to the bathroom, but nothing works.

Why does this happen to a man, who not long ago was laughing, driving and moving with vitality?

As I approach the New Year I don't know whether to hope for life or death for him.







www.datsstuff.com

BY LARRY CLAYMAN

# book review

## **Shooting Stars**

Even with a proven sports writer like Buzz Bissinger (*Friday Night Lights*) on board, it'd be all too easy to cast aside the new LeBron James biography *Shooting Stars* as just another sappy profile of a self-aggrandizing sports superstar. Within the mythology of the modern athlete, there simply isn't much for the everyday person to relate to anymore. For me, however, *Shooting Stars* breaks that mold—partly because of its honesty and emphasis on teamwork, but perhaps mostly because it unfolds in a setting I know very well; Akron, Ohio.

Every celebrity was born somewhere, and in those various somewheres, the locals tend to take a little pride in the success stories their town has managed to produce. But no Akronite (not even Chrissy Hynde of the Pretenders) has ever achieved the iconic status of former St. Vincent-St. Mary High School standout and current Cleveland Cavaliers forward, LeBron James. For this reason, it was all the more

rewarding—and in many cases downright moving—to see just how much LeBron's hometown—our hometown—has meant and still means to him.

Throughout Shooting Stars, James and Bissinger paint a vivid picture of the reality that was James' life long before he became the "Chosen One." The son of a single mother just 16 years his senior, James at times seems to adopt the city of Akron itself as his father figure. He describes its vital influence on his life, name checking dozens of landmarks—well known and obscure—that reflect the sense of community he still values so much, even as an international figure. When LeBron James mentions the Goodyear Clock Tower, the Queen Bee

Laundromat or the beloved local burger drive-in Swenson's, he slowly shifts from folk hero to folks, and that emphasis on reality over the cult of personality is one of the great victories of this book.

If you think the book title is some editor's clever take on how a bunch of kids who had nothing turned into high school stars, you'd be wrong. In just one of many ironies that make up the LeBron James story, "Shooting Stars" was actually the name of the AAU team that LeBron and his cohorts played for in their pre-high school days.

Although this book is clearly LeBron's story, it gives you as much insight into his teammates as it does LeBron. He speaks at length about his friend and court mate Dru Joyce

III. "Little Dru" as he was known, because he barely reached five feet as a freshman, was the son of the assistant coach at St. V. Little Dru's Dad, Coach Dru, had been the coach of LeBron and his close friends during their AAU Shooting Stars years. The story of Little Dru's struggle to be respected is a story within the story and defines persistence and perseverance, culminating in his hitting seven straight three-

pointers in the state championship game as a freshman—all in 10 minutes of playing time! Even as LeBron was clearly the star of the future, it was Little Dru who helped teach LeBron the killer instinct when it comes to "putting away an opponent." The head coach of the St. V. team was Keith Dambrot. He started a basketball clinic at the local Jewish Community Center on Sunday nights and LeBron, Little Dru and the other players who would make up the St. V. "Fab Four" all participated. Little did they know at the time that they would be playing for Coach Dambrot when they went to high school. Coach Dambrot moved on to take the reigns at the University of Akron basketball program before the boys

entered their Junior year at St. V. Not long after he recruited Little Dru and Romeo Travis, two of the stalwarts of the St. V. team, to become the backbone of the University of Akron basketball program. Many in Akron believe that had LeBron chosen to attend college rather than become the first pick in the NBA draft, he would have followed Coach Dambrot and his basketball chums to the local school and really put Akron on the map, much like Larry Bird had done for little Indiana State. We in Northeast Ohio, particularly the Cleveland Cavaliers, are glad he chose the pros.

Will LeBron leave the Cavs after this year as many predict? After reading this book, it is hard to imagine LeBron calling any other place "home."

LEBRON JAMES A BUZZ BISSINGER

Comments? You can email Larry Clayman at lclayman@clayad.com.







#### The smallest part you make... can make a big difference in someone's life

A tiny surgical screw, exquisitely machined and finished. can help return someone to an acrove and productive life Every part you manufacture serves some purpose; each contributes in some degree to the health, safety, security or oconomic well being of others. With so much at stake, flow can anyone settle for less than the most accurate and rollable mochine tools? At Star, on don't think you should. We don't compromise so you don't have to That I why we design and manufacture every piece of advanced CNC mathining equipment, such as our new SR-20RH to be the most accounts, reliable and acountine system available. We understand it's not just a part, II'd a part of the

It's a part of life.



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#### ▲ Abanaki Corporation

Abanaki Corporation has a disk-type plastic disk and 110v fan-cooled gear motor that is a compact, economical tool for removing unwanted tramp oils from coolants and parts washers. The skim disk is twice the thickness of competing disks, making it tough against the heat that warps other manufacturers' disks. The unique boomerang-shape wiper blade extends over the edge of the receiving trough providing an extra inch of wiping area and increasing the capacity of the skimmer. Furthermore, Abanaki's new "no drip" wiper holder system prevents oil from dripping where it isn't supposed to drip.

For more information, please visit Abanaki Corporation at www.abanaki.com/079.

# Boston Centerless Precise in everything we do.

#### ▲ Boston Centerless

Boston Centerless has achieved AS9100B Certification confirming that its quality management system adheres to the stringent standards recognized internationally by the aerospace and defense industry. "By achieving this certification, Boston Centerless has legitimized its proficiency in carrying out the necessary requirements and standards involved with the aerospace industry," says Steven Tamasi, CEO. "Quality has always been the cornerstone of our business, and we welcome the opportunity to demonstrate this through achievements such as AS9100."

For more information, please visit Boston Centerless at www.bostoncenterless.com.

#### **▼** BIG Kaiser

BIG Kaiser Precision Tooling Inc. introduces its newest 12-page full-color catalog, detailing the new Mega Synchro tapping holder. The Mega Synchro tapping holder features a unique mechanism that compensates for synchronization error during rigid tapping. The mechanism reduces the thrust load to both the tap and work piece by up to 90 percent, which improves thread quality and tap life.

For more information, please visit BIG Kaiser at www.bigkaiser.com.



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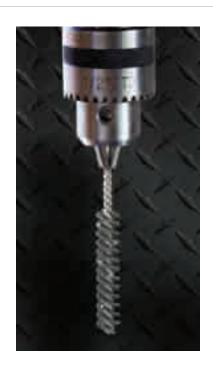


# fresh stuff

#### ▶ Brush Research Manufacturing

Brush Research Manufacturing presents the newest innovation in the continuing evolution of our Flex-Hone technology: Diamond Flex-Hones. These new tools are designed for deburring, edge blending and surface finishing in hard materials like carbide, ceramic and aerospace steel alloys. Brush has engineered these tools using resin bond diamond crystals that have high friability. A crystal that has high friability creates self sharpening edges. The result is a tool that is free cutting with a rapid cut-rate that produces an optimal finish.

For more information, please visit Brush Research Manufacturing at www.brushresearch.com.





#### ■ Doosan Infracore

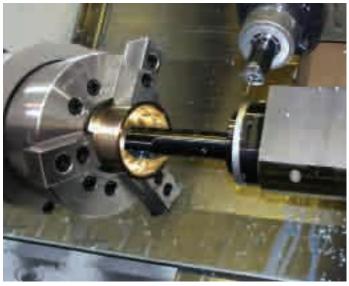
Economy starts with Doosan's Lynx 220—a family of five turning centers with chucks ranging from 6.5" to 8.25", including the Lynx 220G with an extra long, 17.7" X-axis travel and the recently introduced Lynx 220LM with live tooling. Each is equipped with a 20 Hp spindle motor, providing the power to do in a single pass what others do in three or four.

For more information, please visit Doosan Infracore at http://usa.doosaninfracore.co.kr/.

#### Eltool

Eltool's live tool modules combined with the company's right angle heads are designed to machine internally in bores down to l" in diameter. Secondary operations including I.D. milling, drilling, slotting and grooving can now be integrated into turning operations, resulting in higher throughput, reduced handling, and improved accuracy. Designed to fit popular lathes with live tooling capability, the drive modules feature precision angular contact bearings, heat treated and ground shafts, and anti-backlash design.

For more information, please visit Eltool at www.eltool.com.



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#### Eurotech

Eurotech Dual Y-axis 420/710 SY2, a 12-axis bar machine turn/mill, has the technology to produce precise, complex parts in one operation while reducing cycle times, setup time, inspections, handling and scrap rates. The compact yet massive cast-iron machine base assures stability and rigidity in extremely heavy and accurate machining operations. The most advanced technical design encompasses "Clear Shift Sub-Spindle." Both turrets can machine on main or sub-spindle without interference.

For more information, please visit Eurotech at www.eurotechelite.com.



#### **▼ INDEX**

The new R200 Turning/Milling Center by INDEX represents a new generation in advanced turning/milling centers. Two powerful motorized milling spindles and two movable work spindles perform extremely productive and flexible machining operations in two independent subsystems, each capable of full 5-axis machining of bar stock to 65 mm.

For more information, please visit INDEX at www.index-usa.com. \\





#### ▲ ISCAR

ISCAR is introducing the H6oo WXCU 0403..., an even smaller insert, which extends the tool diameter range to include 16 mm and 20 mm diameter sizes. The HELIDO UPFEED high feed milling tools line now includes the complete diameter range of .630" to 5.00". All H6oo WXCU 04, 05 and 08... inserts are peripherally ground. The new FF EWX...-04 endmills are available in .630" and .750" diameters with cylindrical, Weldon, MULTI-MASTER and FLEXFIT shank types and various shank lengths.

For more information, please visit ISCAR at www.iscar.com.

22 Today's Machining World

freshstuff\_1109.indd 3

# fresh stuff



Three new geometries across two new Beyond™ carbide grades augment Kennametal's range of face-grooving inserts and tooling for small-diameter internal and external applications. Available as precision-ground and molded styles in both flatedge and full-radius face-grooving geometries, A4-S inserts are the latest additions to Kennametal's new Beyond™ line of milling and turning tools. They are aimed at face grooving on parts from 16–58 mm (0.630–2.284 inches) in diameter and groove depths from 12–19 mm (0.47–0.75 inches).

For more information, please visit Kennametal at www.kennametal.com.



#### ■ KNUTH Machine Tools USA

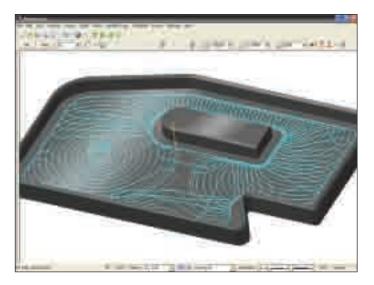
KNUTH Machine Tools USA, a leading manufacturer of machine tool equipment, offers KPB Series manual and CNC ring and profile benders for precise and efficient bending results. These high quality three-roll profile bending machines feature adjustable and hydraulically controlled guide rolls for single part prototype or high quantity production.

For more information, please visit KNUTH Machine Tools USA at www.knuth.de.

#### ► CNC Software

CNC Software's latest release, Mastercam X4, provides expanded machining flexibility and an increased emphasis on speed and automation with a suite of new toolpaths and techniques, including the new Dynamic Machining cutting motion. Dynamic Machining creates a constantly adapting toolpath that delivers more consistent cutting conditions and allows use of the entire tool flute length, saving both time and money. The toolpath is specially designed to take a full depth cut in, often eliminating the need for multiple depth cuts.

For more information, please visit CNC Software at www. mastercam.com.



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#### Mitsubishi

Mitsubishi's MD+CELL combines the Suprema DX44 waterjet for high speed and precision in one automated unit. These technologies work closely together to minimize operator intervention and maximize unattended run time for piece-part manufacturers. The MD+CELL uses a Mitsubishi MELFA six-axis robot to transfer rough cut pieces from the waterjet to be finished on the EDM machine. Combining these technologies ensures that sales and technical support always come from a single-source provider.

 $For more information, please visit \ Mitsubishi \ www.mitsubishi-world.com.$ 



#### ▲ Okuma

Built on Okuma's Thermo-Friendly Concept, the MULTUS B400-W twin spindle horizontal lathe provides g-axis capabilities for true multi-tasking operations. With a maximum machining diameter of nearly 28" and distance between centers of nearly 60", this machine can handle very large workpieces, and the automatic pass-off between spindles reduces the need for operator intervention, reducing cycle time and improving throughput.

For more information, please visit Okuma at www.okuma.com/home.html.

#### **▼** OMAX

OMAX has announced the introduction of its new A-Jet™, short for articulated jet. The A-Jet cuts accurate beveled edges at angles determined by the machine operator or part program. Controlled entirely by OMAX's proprietary Intelli-MAX® software, the A-Jet adds two motion axes that allow tilting the nozzle over a range of o degrees to 60 degrees from the vertical position. The new component can be used to easily produce beveled edges when cutting countersunk holes.

For more information, please visit OMAX at www.omax.com.



# fresh stuff



#### ▲ Siemens Drive Technologies

Siemens Drive Technologies recently announced the introduction of Sinumerik 828D for compact class machine tools. Designed to address the needs of complex turning and milling machines in the job shop segment, the new control combines CNC, PLC, operator panel and axis control for six CNC measurement circuits in a single robust operator panel.

For more information, please visit Siemens Drive Technologies at www.siemens.com/cnc.

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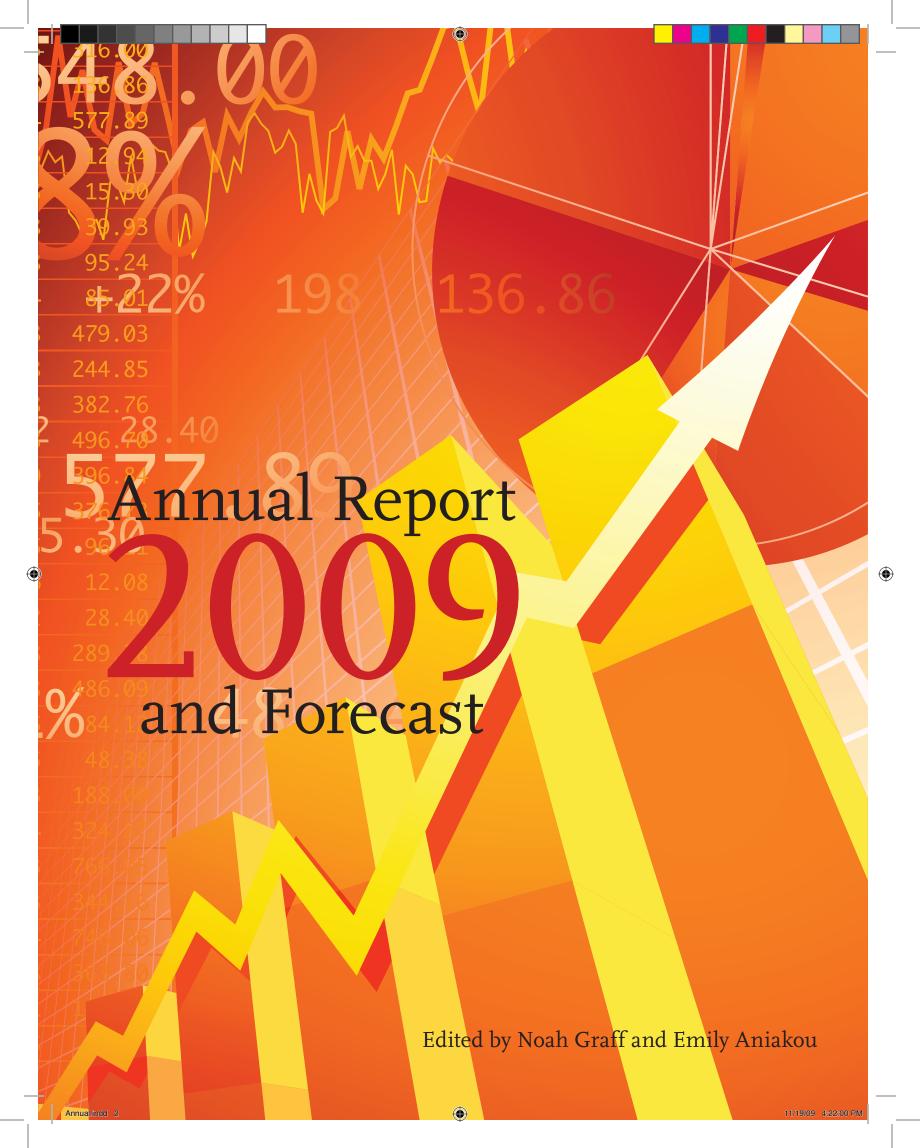
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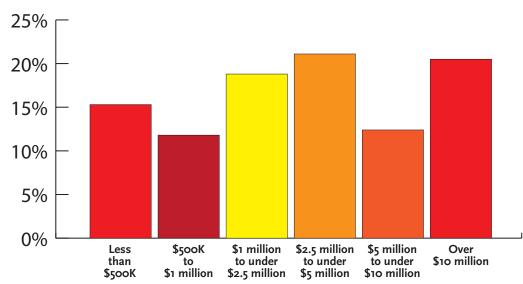
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In late 2009, with a tough year behind us, the question everyone wants answered is, "What's going to happen next?" The staff at Today's Machining World turned to its readers, advertisers and business acquaintances to collect opinions and concerns from different points of view in the precision machining industry. Below are their comments on a survey, revealing the industries' fears, hopes and uncertainties in this tumultuous period.

Emily Aniakou, Managing Editor of Today's Machining World

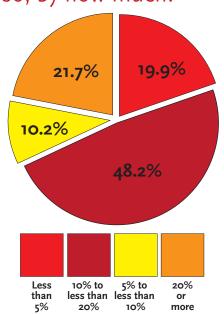
What is your firm's annual sales volume?



#### Do you anticipate 2010 sales to exceed 2009 levels?

60.7% YES NO 18.2% 21.1% **NOT SURE** 

If so, by how much?



I think 2010 sales are going to exceed 2009 sales. But I don't think we'll get to the level we were at in 2008. In the automatics market, when sales went down in 2001 and then came back, they weren't up to the level that they were in 2000 and 1999. I'm expecting that when sales come back in 2010 and 2011, they won't be at the level of 2007 and 2006.

> Kevin Coffman, Vice President Champion Screw Machine Engineering, Inc.

Most people in the survey said, "yes" because 2009 took the brunt of the recession. [The survey shows that most people feel 2010 will be better than 2009, but there's going to be a total loss in this whole thing. That's different from what we're feeling. We feel there is an opportunity to return back to the levels before. But still, in the back of your mind, with the direction we're heading politically everything could get much worse from inflation, to taxes for environmental issues, health issues and funding the stimulus programs.

Wes Skinner, President, Manth Brownell Inc.

November/December 2009



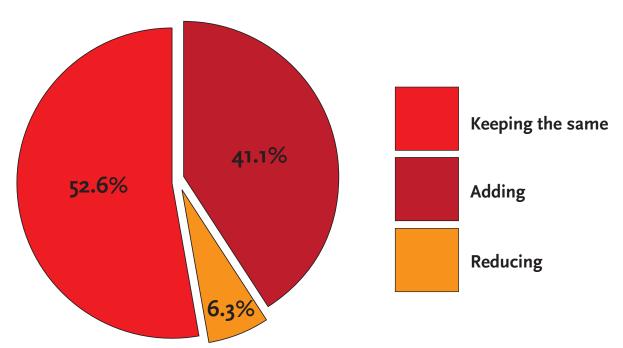
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# In 2010 do you plan on adding, reducing or keeping the same number of employees?



The business landscape will get more competitive as manufacturers look to replace lost revenue. In many cases, this means getting into new lines of business or pursuing more complex work than perhaps they have done in the past. One of the challenges that they will face in doing so is that many people will be looking to realign their offerings without the ability to add much if any new staff. This means existing personnel will have to adapt their skill sets and knowledge base to accommodate the changes to come.

Hanan Fishman, President, Delcam PartMaker Inc.

[That most people in the survey say their company will keep the same number of employees and that some will hire] seems reasonable, as I believe many companies let people go too quickly. We should have some rehiring now that the economy seems to have stabilized. I note that around 50 percent are keeping the same number of employees, so the uncertainty is still there. We are in this group and probably will not hire in 2010.

Andrew Benson, Chief Marketing Officer/Co-General Manager, Iscar Metals, Inc.

[Rather than hiring or laying off employees] I think companies should be relocating employees within the company. For instance, machinists should be retrained to have skills in programming and operating CNC machines.

Michele Tajariol, TAJMAC-ZPS, Zlin Czech Republic

November/December 2009 29



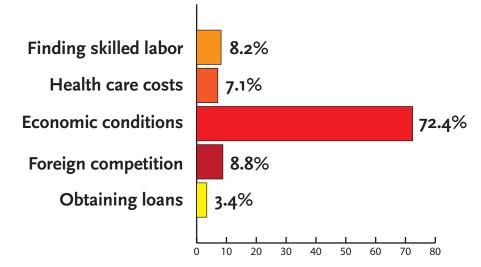
#### What concerns you the most in the coming year?

My concerns are more macro than micro. The moves I see our government making—none of it is towards a cure. I continue to see stupid band-aids being applied to cancer by this administration—specifically in manufacturing. It scares the heck out of me that if that kind of behavior is not stopped by our government there will be nothing left of manufacturing on our shores in the next five to 10 years.

Greg Knox, Knox Machinery

Economic conditions. I'm not worried about inflation. I'm concerned about the housing market and the trucking market, which we're involved with. Those markets have to improve because they affect so many people in so many different industries.

Ed Basler, CEO, E.J. Basler Co.



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\*According to various Swiss sources Tornos, Switzerland is no longer supporting Bechler and Petermann products as of May 1, 2009.

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Are you more worried, less worried, or do you feel the same about the likelihood of your customers paying you promptly in the coming year?

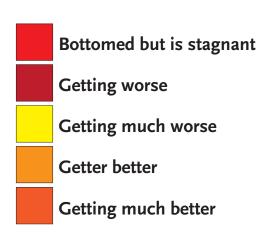
31.7% MORE WORRIED5.1% LESS WORRIED63.2% FEEL THE SAME

Thirty one percent "more worried" indicates that, like us, people were surprised with companies that they did not expect ever to have credit issues, and that no one was immune to this drop in the economy (large or small companies alike). Permac Industries would have to select between "Feel the Same" and "More Worried." We will be doing more due diligence with all customers moving forward—current and new alike. Hopefully our stronger small community banks and SBA programs will help us all get through.

Darlene M. Miller, President/CEO, Permac Industries Inc.



# Regarding the economic climate, the recession has/is: 4% 22% o.6%

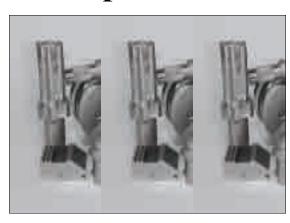


I think probably what we're seeing is more or less a bottoming for the moment. But we're seeing bottom bouncing from the inventory. People have run out of stuff on certain product lines, and they're replacing it. But I don't see any job drivers for the future. No big expansions in any particular industry that I can think of. So people are going to try and hold their own—keep their inventories low, keep their costs low, and allow the economy to heal if it will. If the politicians can leave it alone—which I don't think they can do.

Tom Meaden, President, Meaden Machined Products Co.

November/December 2009

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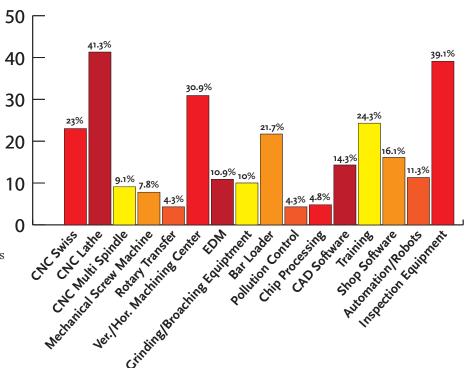
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#### Do you plan on buying any of these in 2010?

At my company a lot of my focus is on improving what I already have. I still have a customer base, it's just that the amount of work has shrunk. So I'm trying to add value and improve service. But a good friend of mine with a very small



shop, has customers in the Detroit area who are just gone. So his efforts are more on the outside. He's looking for new types of customers. Training, inspection equipment, shop software—that stuff for him is a necessity in order to get the business back where it was. He has to change, where as I just need to keep what I have.

Peter Bagwell, Slater Tools Inc.



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#### WITH NOAH GRAFF

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

Dear Shop Doc,

I have a part that has an internal hexagon that needs to be put into the part in relation to milled features. Is there some way that a wobble broach can be oriented to the C-axis on my CNC Swiss?

Vexed Hex

#### Dear Vexed,

On a full featured CNC Swiss there is a unique solution to this issue. As you know, rotary broaching holders offer no way of orienting the polygon shaped broaches to the work. The method that follows will also allow you to broach faster and will never "spiral" on a deep broached feature.

If your CNC Swiss has a Fanuc control equipped with the polygon cutting option, you should be able to use an adjustable angle live drill unit to wobble broach the hexagon shape while holding angular relationship to other live tool features on the work. Here's how; mount an off-the-shelf rotary broaching bit into the angular drill unit and set the angle to 1 degree. This puts the broach in the same attitude as it would be if it were sitting in an ordinary rotary broach holder. If you have a CNC lathe or Swiss with a programmable B-axis, simply command the live tool B-axis to a 1 degree angle.

Use the G<sub>51.2</sub> polygon cutting command to orient and synchronize the live tool spindle to the work spindle. Ordinarily this command is used for cutting external polygons on the work using a polygon attachment and cutter, but it works just fine for wobble broaching.

Example of the command when used for broaching:  $G_{51.2}$  P1 Q-1 R45.0;

The P value equals the ratio of the work spindle to the tool spindle. Q equals the ratio of the live tool spindle to the work spindle. The sign of the value determines the spindle rotation direction of the live tool. A negative value is usually the

counter-clockwise direction, which would match a clockwise direction on the opposing work spindle.

If the live angle tool attachment has a gear ratio to the commanded speed then you would use P and Q to compensate for that ratio. For example, if the live tool spins at 4,000 rpm when you program 2,000 then you would program values of P1 Q-2.

The R value sets the angular relationship of the live spindle to the work spindle. This allows you to adjust the orientation of the broach in relation to the C-axis of the main spindle. The value range is from 0 degrees to 359.999 degrees. I prefer to programa macro variable instead of a numeric value so that the orientation can be adjusted without editing the program. For example—G51.2 P1 Q-1 R#510: Variable 510 can now be used as an offset to adjust the orientation of the broach to the work

Once you have commanded the polygon turning function G<sub>51.2</sub>, program the broaching operation the same exact way you would if you were using a conventional rotary broaching tool. In most cases you can broach at a much higher rpm using this method than you can with a rotary broach holder. You are only limited by the maximum speed of the main or tool spindle. Cancel polygon mode by commanding G<sub>50.2</sub>.

Dan Murphy Tsugami REM Sales

Dan Murphy is a regional sales manager for Rem Sales LLC., a U.S. Tsugami distributor.

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.



# shop doc

Dear Shop Doc,

We are a mold shop specializing in cutlery molds with large cavities and tiny details, usually from 420 stainless steel hardened to 48 to 50HRC. Some corner radii are as small as 0.008". For years, we have been using EDM machines to burn our hardened cavities and cores—a very time consuming process. I've heard that high-speed hard milling is the new process for mold-making. Can it really replace our EDM?

Make Us Faster

#### Dear Make Us Faster,

You are right. High Speed Machining (HSM) has made a huge impact on the mold-making process in recent years. HSM is a machining process using smaller tools with high rpm and feed-rate to perform faster, lighter cuts. Surprisingly, tackling hard milling is simplified using this high-speed technique. Conventionally, cutting hardened tool steel with large tools generates a lot of heat that breaks down the end mill rapidly, making milling an impractical option. Hence the EDM (Electrical Discharge Machining) became the standard process to machine hardened steel. With HSM however, every cut is small, light and fast, minimizing thermal effects and lowering heat transfer to the end mill, so the tool will last to finish the cavity. Together with the advances in cutting tool technology, HSM Hard Milling has become a very practical alternative with major savings in time and cost.

To determine whether HSM can replace your EDM process, you must study the characteristics of your mold cavities. Obviously a 90 degree sharp internal corner can only be accomplished with EDM. For big cavities, milling is always faster than EDM. As for small features, the recommended rpm goes up proportionally as the end mill radius goes down. Small radius alone is not the issue. What makes hard milling difficult is when the end mill becomes too slim and therefore lacks strength to support its cutting. It is the ratio of the end mill diameter to neck length that is important. When hard milling with end mills under 1/4", the rules of thumb are: a 1:3 ratio is considered stubby, 1:5 is practical, 1:8 is difficult and

requires a lot of careful programming, and 1:10 probably is the limit.

Having said that, please bear in mind that HSM also compliments the EDM process. Mold cavities typically consist of free-form surfaces that are machined with ball end-mills, and the "cusp" between paths decides the final surface finish. For example, a 1/8" ball end mill with 0.003" step-over will produce a "cusp" height of 18 micro-inches. A silky smooth surface finish requires densely packed tool paths that make machining at a high rpm and feed-rate essential for cycle time reduction. This is true for both hard milling and electrode machining.

When you are considering HSM for your shop, please be aware of the upfront costs associated. A true high speed machine costs more than a conventional CNC machining center. They typically have bridge construction and are equipped with high-speed motor spindles with anywhere from 20,000 rpm to 50,000 rpm. Other critical features to look into include advanced CNC with look-forward capabilities, large storage, Ethernet connection and thermal control. Last but not least, it is the human factor, from process planning and tooling selection, to programming and setup that separates the men from the boys in HSM implementation.

Jesse Xi Chen Jesse Xi Chen Compumachine Inc.

Jesse Xi Chen is a VIBRA-FREE product manager at Compumachine in Danvers, Mass.

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1-3/4" 8-spindle, 1970

2-1/4" 6-spindle, 1962, 1973-79 (3)

3-1/4" 6-spindle, 1973,

6-5/8" 6-spindle, 1979

5-5/8" 6-spindle, 1978,

#### **ACME**

7/16" RA6, 1975 (6)

1-1/4" RB8, 1981

1-5/8" RBN8, 1979, thdg., pickoff

1-5/8" RB8 thdg., pickup '68-72 (5)

2" RB6, 1979

3-1/2" RB6, heavy recess, '66

2-5/8" RB8, 1979

#### **CNC INDEX**

G200, 1997, Index G300, 1997, Index

ABC 60mm Index '96

#### **SCHUTTE**

SF51, 1985 AF32, DNT, 1998 (2) SF26, 1979

SF51 PC

WICKMAN AND INDEX

#### **CNC SWISS**

Star ECAS 20, 2008

Star ECAS 32, 2008

#### **CNC MACHINING CENTER**

Haas VF255, 2006

#### **CNC LATHES**

Daewoo 1500 LY, 2006 Doosan VT900, 2008

#### **HYDROMATS**

Pro 20, 1999

HW 25-12, 1994

HB45-12, 1996

HB45-16, 1989 - '97

HS16, 2001

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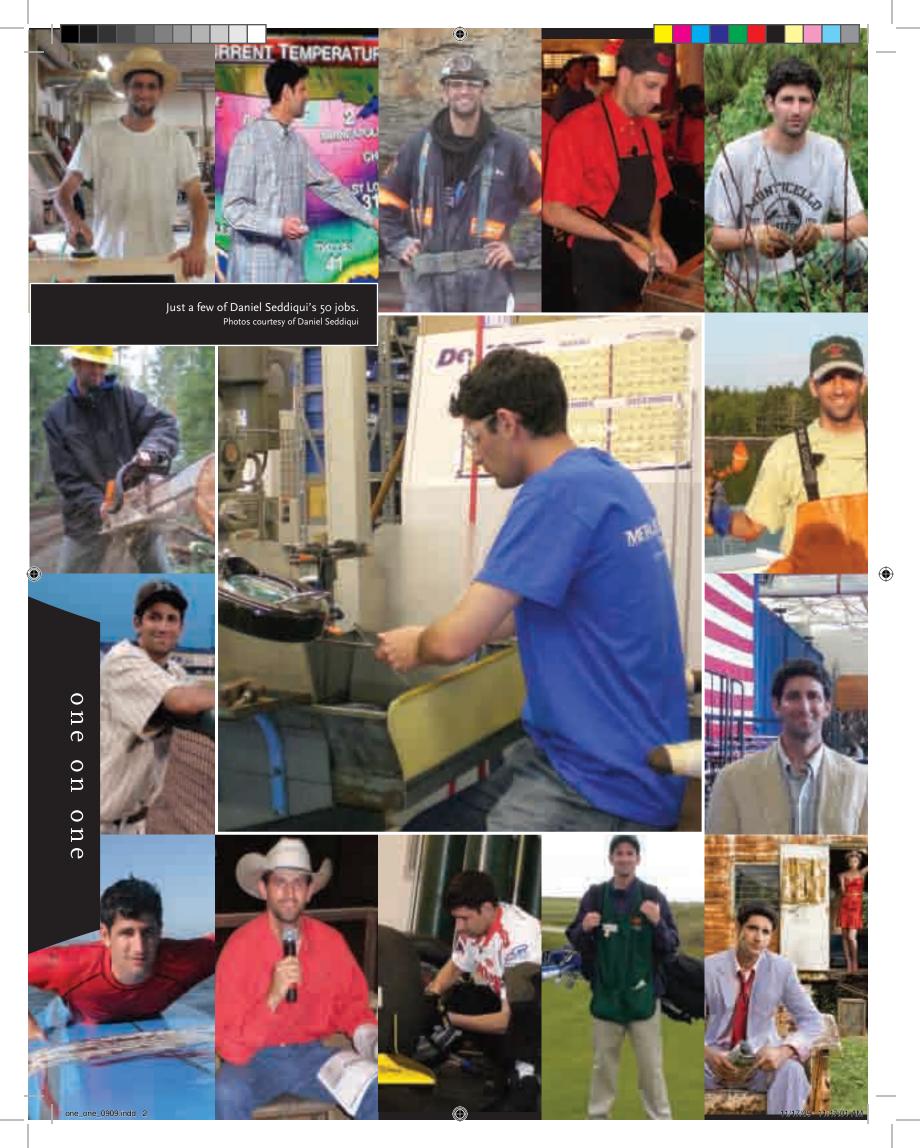
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Every Wickman spare part









# one on one

INTERVIEWED BY NOAH GRAFF

# Daniel Seddiqui: Weeks, States, Jobs

Daniel Seddiqui, a 27-year-old native of Northern California, recently completed his quest to work 50 different jobs in 50 states in 50 weeks. He worked as a lobster fisherman in Maine, surfing instructor in Hawaii, bartender on Bourbon Street, wildlife photographer in Alaska, and in a machine shop in Minnesota. He is currently on a lecture tour, writing a book and editing a documentary about his journey.

## What gave you the idea to do this project?

**DS:** I graduated from college about four years ago with a degree in economics but couldn't land a job in my chosen field. I failed 40 interviews. After three years of living in five states doing odd jobs from working at Bed Bath & Beyond to part-time accounting, I decided to embark on a journey to try out jobs stereotypical to each state, to see what America's all about.

### What were a few of your favorite jobs?

**DS:** I really liked bartending on Bourbon Street during Mardi Gras. I also liked being a dietician in Mississippi. Our country has an obesity issue. I was working in the fattest state in America, going to hospitals and nursing homes, working alongside a professional. I was changing people's lives by educating them and motivating them to eat right and be active.

#### You worked in a machine shop?

**DS:** I was a machinist making medical equipment at Metal Craft in Elk River, Minnesota. A lot of the [machinists] had gone to technical schools and some were high school dropouts who knew they wanted to do this for the rest of their life. It was surprising—a lot of them had done it for 30 to 40 plus years. I guess once you do it, you want to stick with it. That's kind of a rare thing nowadays.

#### What was the process like for finding these jobs?

**DS:** I set the jobs up as I went, but I had a month buffer zone. During my lunch breaks I would call another state [looking] for my next job. I would keep calling and calling and calling, using Google to search for these companies. I would try and sell myself and my idea. Sometimes I would say, "I'm very serious about your industry but there's no way to know [if it's right for me] unless I can try it out." I would think outside the box. When I was [trying to be] a border patrol agent in Arizona they wouldn't hire me, so I got press credentials and wrote for a local Tucson newspaper in order to walk alongside a border patrol agent.

#### Did you get rejected a lot?

**DS:** I estimate about 5,000 rejections, about 100 per week. But 90 to 95 percent of the time [the employers that did hire me] asked me to stay. After they handed me a paycheck, they said, "If you want to come back after your mission, we would love to have you."

#### What did you learn on your journey?

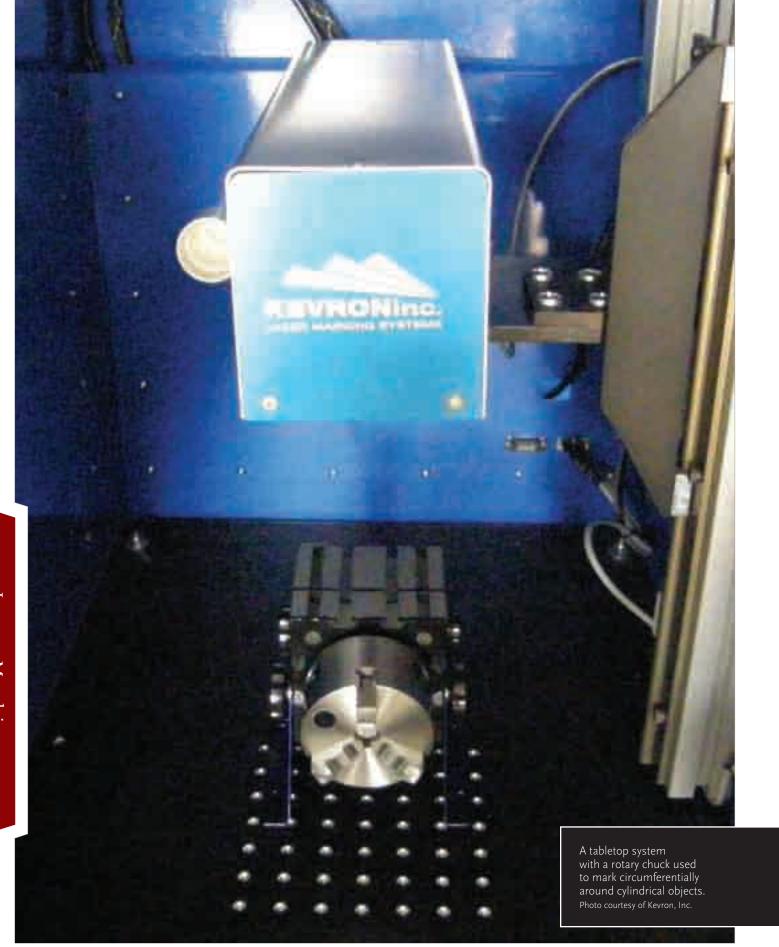
**DS:** I learned a lot about our country. I lived with Amish in Pennsylvania and cowboys in South Dakota. I had no idea what these cultures were like until I went there. In California, I felt like I was in a bubble studying economics. I had no idea what these careers entailed until I tried them—now I know.

#### Do you think this project has had a positive impact on other people?

**DS:** Yes. I've helped a lot of people along the way. For example, I was working as a boilermaker, and there was a dentist who was out of work for three years. He saw me on the local news in Kansas City, Missouri, and said, "Wow, this guy is going around doing everything, showing that he's an asset to these companies. I have welding skills, why don't I go and apply for a job there tomorrow?" He showed up at the company and got hired on the spot. Rather than sitting idle, he's doing something and making money.



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# how it works

By Barbara Donohue

# Laser MARKING

Direct Part Marking (DPM) with a laser offers a way to permanently identify parts for tracking, tracing and control.

In medical, military, aerospace and other applications where safety or security are especially important, more and more manufacturers and end users are requiring permanent identifying marks on individual parts to aid in traceability in case there is a problem or failure in the future. Individual part marking is also becoming a standard practice in many non-critical applications to enable automated inventory control and other functions. "Eighty percent of the time marking is customer driven. The customer says, 'You have to do this,'" said Kevin

Warman, co-president at Kevron, Inc., Louisville, Colo., a manufacturer of laser marking systems.

Marking, scanning and tracking individual parts in-house can help with monitoring work in process and staging parts for operations on different machines, and the ability to track individual parts and assemblies through manufacturing can be invaluable in troubleshooting when errors occur.

The U.S. Department of Defense (DOD) has played a role in the increasing use of laser marking and other identification technologies. The DOD now requires Item Unique Identification (IUID) for all tangible property valued at \$5,000 or more. The unique identification code must be marked directly on the item

or permanently attached, and must withstand the same environmental conditions as the item. The data required in the mark typically includes the manufacturer and part identification—such as a part number and/or serial number.



**Above:** A laser at work marking a logo on metal. Photo courtesy of Kevron, Inc.

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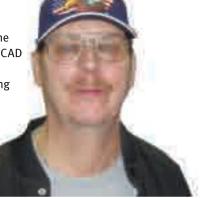
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# how it works

**Below:** A custom tabletop laser marking enclosure for military use.



# Making Your Mark

You have many options for labeling parts or assemblies. Direct part marking (DPM) involves marking on the surface of the part with laser, ink jet, chemical etch, dot peen or bonding processes. You can also attach labels, but they tend to be more expensive, and the labels can fall off. For machined metal parts, laser marking directly on the part offers speed and permanence not available with other methods.

Of course, you could program any CNC machining center to mill names, numbers or symbols on a part, said Ron Quinlan, co-president at Kevron, Inc. However, part marking may not be the best use of an expensive machine. You could send parts out to a laser-marking shop. Or, you might find it cost effective to set up a laser marking station in your shop to take care of all your part-marking needs.

Some forward-thinking machine shops have their own laser marking equipment, Warman said. "If they treat it as [they do] their CNC machines or lathes, it becomes a profit center." They can offer laser marking to their machining customers as a value-added option, and can also sell contract laser marking services to others. Most shops can make their own fixtures so they can process multiple parts at once, Quinlan said. A shop might charge \$60 to \$100 per hour for the laser marking machine. So if marking a particular part takes 20 seconds, that works out to 33 to 56 cents per item marked.

### Lasers at Work

Laser marking can be done in a number of ways. A laser can engrave lines or other shapes into the material, it can remove paint or another type of coating to allow the underlying material to show, or it can cause a color change in the desired pattern on a surface by a localized annealing process.

Engraving vaporizes some of the material, creating visible dimples or grooves in the surface of the part to form the desired shapes. The laser can produce textures, labels, ornamental designs or identification marks such as data

matrix codes. One shop that machines the heads for golf clubs, customizes the heads by laser-engraving them with names, dates and other information relating to a particular country club or tournament, said Scott Wolfson, president, All-Marks, LLC, Reseda, Cal., a supplier of laser marking equipment.

For parts that need a visible mark but cannot tolerate any grooves or roughness, the annealing method uses the laser to locally heat the surface of the metal so it changes color. Bright steel turns black. Aluminum turns white. This



**Above:** A logo laser-marked on anodized aluminum. Photo courtesy of Kevron, Inc.



Above: Microscan Mobile Hawk Handheld direct part marking imager reading a 2-D data matrix. Photo courtesy of Kevron, Inc.

Inset: Example of a 2-D data matrix pattern.

# how it works





Above Top: Serial number marked on an industrial hose fitting. Above Bottom: Flat surface mark on a surgical instrument. Photo courtesy of Kevron, Inc.

# We have laser-marked a data matrix on the head of a pin and put one on the side of a train. ??

approach leaves a visible mark but does not affect the surface finish or other properties of the workpiece. It is often used for marking medical instruments or implantable medical devices, where there must not be any grooves, holes or porosity to harbor bacteria. As with other aspects of the manufacturing process for medical devices, the marking method also needs FDA approval.

## Data Marking

Two-dimensional (2-D) data matrix codes are often directmarked on parts. A data matrix consists of an array (or matrix) of many rows of light and dark blocks. Several different types of data matrix have been invented. A common 2-D format used for laser marking consists of a square array, which has all dark blocks along two adjacent sides, which appear as solid lines, and alternating light and dark blocks on the other two sides. This configuration enables the reading device to determine the correct orientation of the mark. A

2-D matrix is scalable in size to meet the needs of the product on which it is marked, said Wolfson. "We have lasermarked a data matrix on the head of a pin and put one on the side of a freight train."

When you set up a laser marking system to mark a part, the desired data is encoded in the matrix by the software of your marking system. When the mark is read, the reader essentially takes a picture of the 2-D matrix and the reader software determines the meaning of the combination of dark and light blocks.

You could also mark parts with the familiar onedimensional bar codes, similar to the Universal Product Code (UPC) bar codes seen on supermarket items. However, a data matrix can contain 100 times as much information as a bar code, in one-quarter of the space, said Kyle O'Brien, product manager with Microscan, Renton, Wash., a manufacturer of automatic identification and machine vision solutions for ID tracking, traceability and inspection.

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**Above:** A tabletop laser marking system. Photo courtesy of Keyron, Inc.

#### Check It Out

Customer specifications may require you to verify the marking on the part. Over time, any part marking system may drift, producing marks that become progressively more difficult for readers or scanners to interpret. A verification system scans the mark and rates its quality—how closely it matches the specification for that particular type of data mark. A basic verification system runs about \$5,000, O'Brien said. For comparison, a handheld reader capable of interpreting 2-D matrix marks might cost about \$500. Some laser suppliers offer laser marking and mark verification systems together on a cart that can be rolled about the shop.

#### Safety

Even relatively low-powered lasers can cause burns or eye damage, so self-contained laser marking systems include an enclosure around the working area, with interlocks that prevent the laser from operating when an access door is open. In many systems, a heavily tinted window allows you to view the laser at work.

Since the laser is heating and maybe vaporizing material to make the mark, fumes come off the workpiece. These must be removed with a suitable fume extraction/filtration system.

#### Ready for Lasering

Vendors specializing in laser marking can provide you with a self-contained marking system that includes the laser,

its power supply and controller, a protective enclosure, software to control the process and a computer that runs the software. Several different kinds of lasers can perform marking operations. When selecting a system, be sure to investigate any special power or cooling requirements. Find out what normal maintenance is required and whether the laser head is likely to require any adjustments over time. Also, ask about the expected service life of the laser head and how much replacement will cost.

Typical standalone systems available from All-Marks use a 10- or 20-watt pulsed fiber laser, Wolfson said, and include a light-tight enclosure. The cost for such a system would likely be \$40,000 to \$50,000, he said, depending on the power of the laser and whether you choose a simpler or more sophisticated enclosure. Leasing may be available, with monthly payments in the range of \$825 - \$1,000, he said.

Laser marking systems these days don't have much of a learning curve, according to Wolfson. When asked what it's like getting started, he said, "If we sell a laser and take it in to a customer and teach the people [how to use it], we're gone in two hours, including having a cup of coffee."

If there is enough space to install a laser head and the necessary safety guards inside a machine tool or other manufacturing equipment, you may be able to integrate automated laser marking into your process. Some laser heads are quite compact; for example, the head from Kevron is about 15 x 5 x 4.5" (381 x 127 x 114 mm).

Whether you partner with a contract laser-marking shop, or decide to purchase your own marking equipment, laser marking can be a valuable addition to your manufacturing capabilities. And once you have marking in-house, you may find that marking and tracking parts and tools within your shop can help you improve your process flow and maintain consistent product quality.

# Contributors to this article:

All-Marks, LLC: www.all-marks.com

Kevron, Inc.: www.firetrace.com

Microscan: www.microscan.com

# For more information:

Unique Identification 101 booklet:

 $www.id\text{-}integration.com/docs/specs/UID\_Basics\_101.pdf$ 

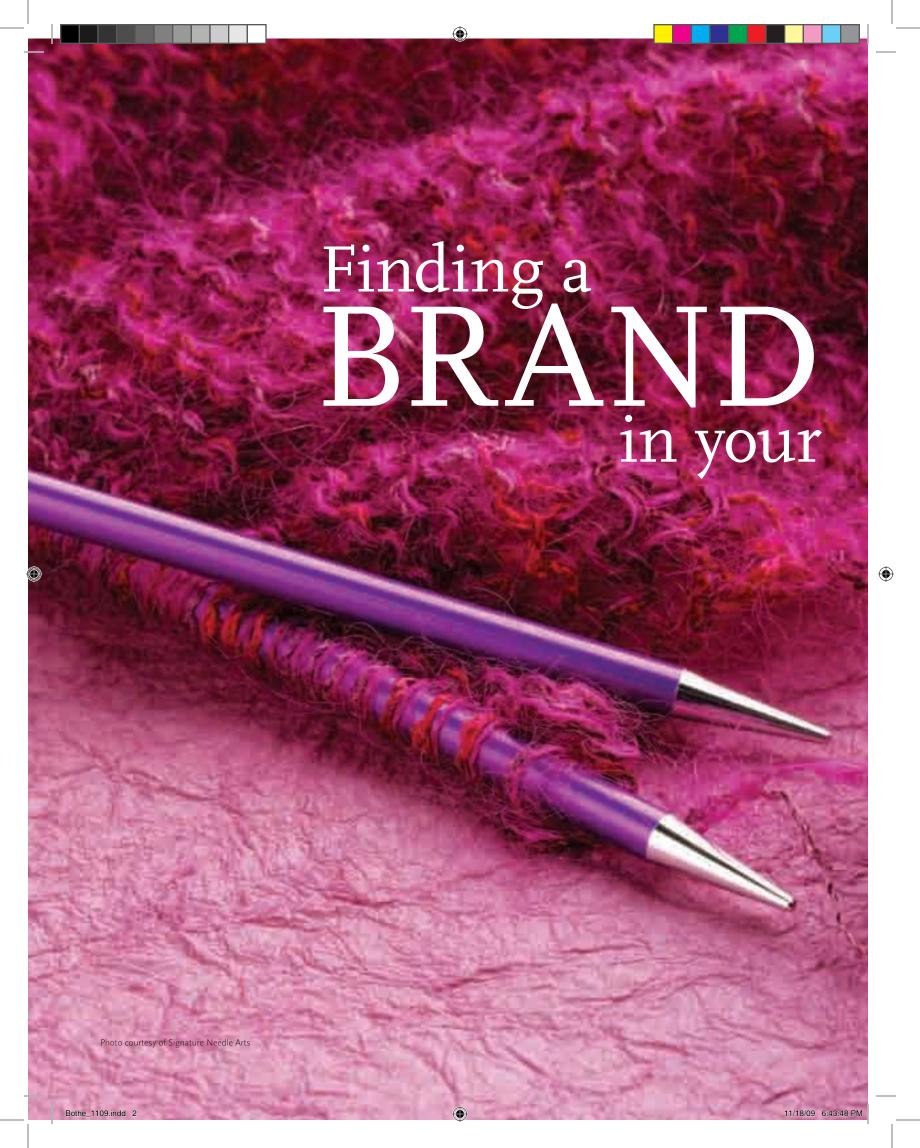
Laser marking video:

www.focusedlaser.com/videodemo.html

How a laser works:

www.colorado.edu/physics/2000/lasers

www.troteclaser.com, click on "Solutions" and then on "Laser Info"



CATHY BOTHE WAS KNITTING A SWEATER FOR HER GRANDSON JACK IN HER KENOSHA, WISCONSIN, HOME ON A SUNDAY NIGHT IN 2006, AND IN HER WORDS, "BITCHING ABOUT THESE CRAPPY CHINESE NEEDLES," SHE WAS USING.

HUSBAND, KENT, WHO HAD BEEN CUTTING METAL CHIPS IN THE FAMILY MACHINE SHOP FOR 40 YEARS RETORTED, "SO WHY DON'T YOU DO SOMETHING ABOUT IT?"

# INTERIOR GRAFE

At that time, there was no high-end knitting needle, only the generic Wal-Mart needle. Cathy and Kent often talked about folks who restored cars. Did they go to the dollar store to buy their sockets? No, they would invest in a Craftsman or Snap-on because they understood they were buying a tool to last a lifetime.

That night, Cathy and Kent drove over to their machining facility to make the needles Cathy always wanted but could never find in yarn shops.

After running some aluminum barstock through a Mori Seiki AL-2 lathe, they suspected that they had the unique product every job shop owner dreams of, but most never find.

Cathy, the president of Bothe and Associates, a 59-yearold shop started by Kent's father in a humble garage, enlisted her daughter Laura and son Paul to work in the needle company they named, Signature Needle Arts. Bothe and Associates was already busy serving a broad range of industrial and medical customers, but the Bothes thought that a product that offered a superior tactile experience even at 10 times the price of generic needles from China would find buyers among knitting enthusiasts.

A business consultant could have given Cathy a dozen reasons why making a utilitarian commodity product into a piece of useful jewelry was a stretch for the machinists from Kenosha. But probably because she didn't know what she didn't know, she threw herself into the project with the naïveté of a zealot.

It turned out that even without a detailed business plan, possessing a plant full of CNC lathes and a million manhours of manufacturing know-how gave the Bothes an advantage in bringing their unique idea to life.

Think of the hypothetical "housewife in Duluth," who thinks about, and maybe even pencils out, what a spectacular needle would look like. She'd likely have no clue about machining a point on a stringy piece of





**Above:** An array of available Signature Arts Needles Photo courtesy of Signature Needle Arts

have Cathy and Laura Bothe decided to bring 75 pairs of nsider their machined needles to a needle arts trade show in

needles they've manufactured. Photo by Today's Machining World

aluminum barstock. She probably never would have heard of anodizing or CAD/CAM. She might consider sending a product sketch to a Chinese company (that would honor the intellectual property, of course) and wait for a prototype to be mailed back to her in a week.

The Bothes were able to compress the learning curve on production but were novices at bringing a top of the line consumer product to buyers who didn't know they had always wanted it.

Meanwhile, business in the machining world was evaporating, and the pie in the sky knitting needle effort was starved for marketing money. their machined needles to a needle arts trade show in Chicago in August 2007, hoping to elicit a little buzz, and if lucky, sell some product.

Above: (left to right) Laura Bothe and Cathy Bothe enjoying the

To their amazement, customers lined up 10 deep to see the needles of their dreams. Kent had stayed home, but was on pins and needles waiting for a phone call from Cathy to report customer reaction. The call seemed to never come because Cathy and Laura were just trying to cope with the throng of buyers. This was the moment they knew they had a business, not just a sideline to the machining company.

Possessing a plant full of CNC lathes and a million man-hours of manufacturing know-how gave the Bothes an advantage.

They also discovered that a key to developing the brand was reaching the online knitting community. Most knitters are women and many of them read blogs on the Web related to



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their hobby. The Bothes gained tremendous exposure on a massive Web site devoted to the knitting and crocheting community called, Ravelry.com. The site now has over 513,800 registered users from all over the world. Through Internet buzz, blog mentions and displaying at shows, the Bothes quickly gained sales and credibility in the fiber arts world.

They realized that their biggest challenge is convincing people that using Signature Needles makes the knitting experience significantly more pleasurable and efficient. Stitched to that hurdle is the guilt factor. Women are often reluctant to spend money on elegant tools for themselves, though they are less likely to skimp on yarn.

Cathy said, "If you're going to make a gourmet meal, you must [have the best] ingredients, so we buy very high grade aluminum, all American-made aluminum. That's made a big difference for us." Signature Needles uses high quality grinders that get the diameters to within a thousandth of an inch total, which is important so knitters can make an accurate stitch size. They anodize in the United States, which enables them to create five lush colors—emerald green, ruby red, gold, amethyst purple

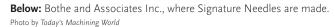
and sapphire blue. The high-grade aluminum also allows their needles to be polished to a beautiful finish.

Chinese needles are made from hollow tubes of aluminum. But Cathy says you can never get quality points with hollow tubes. She says you can keep forming it and forming it, trying whatever you can think of to make the needles pointy, but you just can't get the accuracy or the radius on the tip that Signature can achieve with their quality materials and processes.

Kent Bothe uses the comparison of buying a fancy golf putter for \$200 or a Calloway driver for \$300. He rhetorically asks if anybody who cares about their golf game would whack the ball off the tee with a 40-year-old Sam Snead persimmon driver.

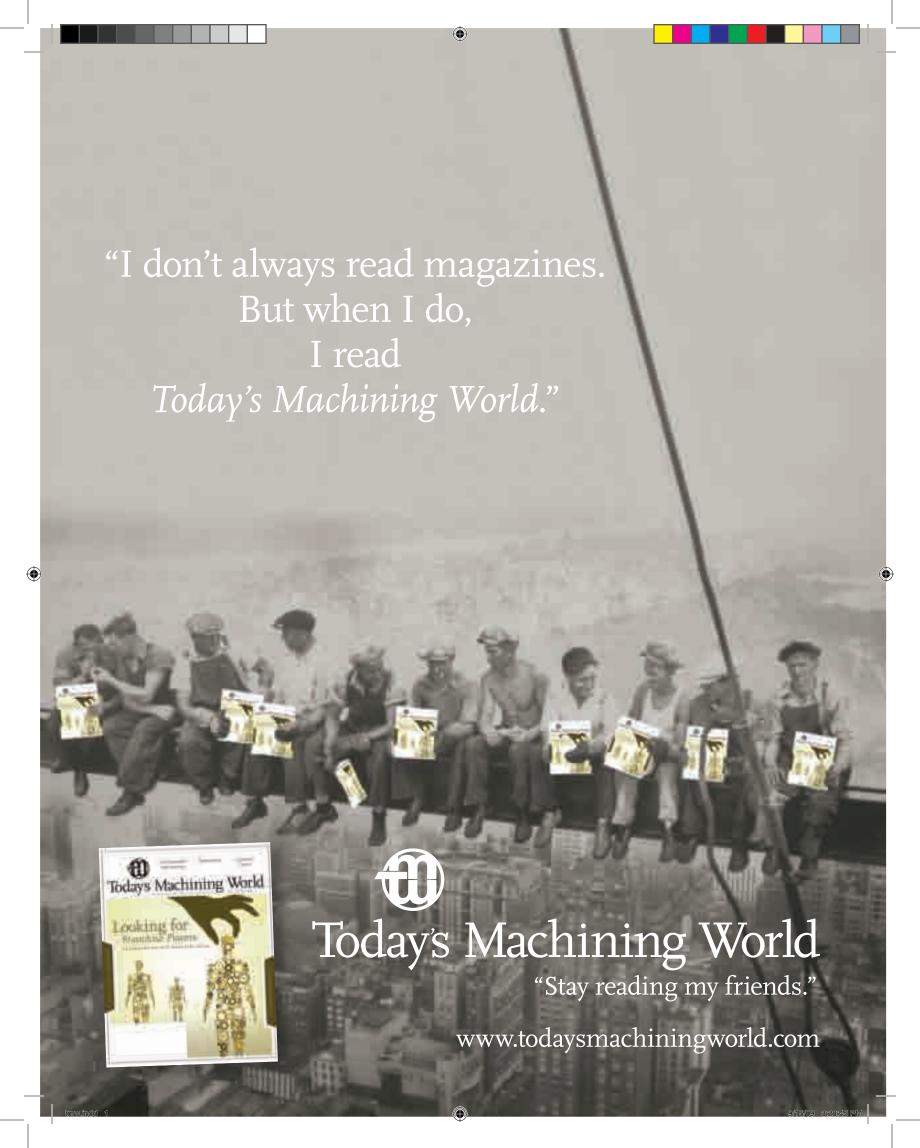
I observed a reluctance to splurge on this type of product in my friend Janet Herbstman, who first exposed me to the knitting world. Janet is a fanatical sock knitter who could easily afford the Signature Needles, yet she told me she could not pull the trigger on a set of four beautiful double-tipped stainless steel Signature Needles because of the \$45 retail price point.

Signature's single point needles have three different

















**Above:** Needle points being machined. Photo by *Today's Machining World* 

point profiles; Stiletto, Middy and Blunt, which no one else has ever done. They also have three lengths available; 7", 10" and 14", and you can pick a decorative cap.

Single point needles sell for \$28 a pair for the smaller sizes (US I-US 5) and \$32 a pair for large diameter sizes (US 6-US 10).

After our interview with the Bothes I brought back a set of double points for my friend, Janet. She woke up at 6 a.m. the next morning to try them out and immediately loved them. She says she will be buying a lot more in the future.

Cathy says people love to have choices, yet a typical big company has a different attitude. ??

Cathy says that people love to have choices, yet a typical big company has a different attitude. They say, "This is what we're making. Here, buy it." Signature says, "Tell us what you want." This is why they now have a 7" needle, which no one else makes.

The Bothe family's Signature Needle Arts story is one





**Above:** Measuring a needle point. Photo by *Today's Machining World* 

for all seasons, but has particular meaning now as machining companies search for a way out of a disastrous downturn.

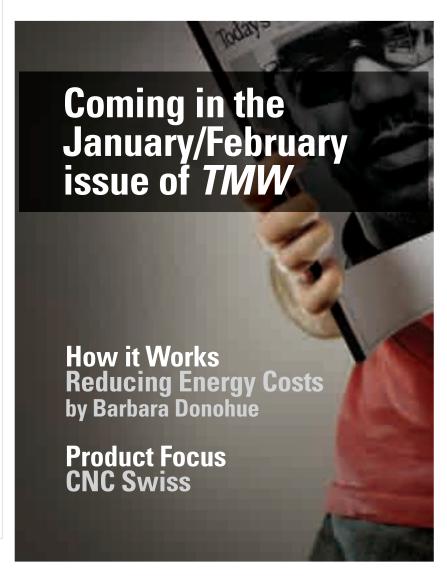
The Bothes had a good idea—the superior needle. They had the energy, guts and smarts to pursue it in a big way. They have capitalized on their machining knowledge to make a consumer product with the precision and finish required of a medical implant. They have also utilized social media like Twitter and knitting blogs to gain a following.

"We do email surveys and have a large email list of customers," said Cathy. They gather feedback from those and exhibit at consumer trade shows. "People come to our booth all day long," said Cathy. "We also have people emailing us from our Web site to tell us exactly what they'd like to see—new caps, lengths, everything."

The Bothes are worried about knockoffs, so they are running as fast as they can to build their brand, knowing that the copycats will eventually strike.

They bought a new Tsugami CNC Swiss-type lathe to machine their needles and it is now the busiest machine in the shop. In 30 months they have built a business within a business. In the cluttered world of precision machining, they have found a needle in a haystack.





November/December 2009

THE FOLLOWING COMPANIES HAVE PROVIDED INFORMATION ON VERTICAL MACHINING CENTERS.

# product focus

ertical machining centers come in many shapes and sizes. As the demand for small components has increased and the price of industrial space has escalated companies are looking for compact options with big capability.



▲ Doosan Infracore America Corp.

Doosan's new family of DNM vertical machining centers combine speed and economy with the metal-cutting power that's long been synonymous with the Doosan name. These new machines are available in three sizes, with each size available as the DNM standard speed or as the high speed DNM HS. Powering the DNM are spindle motors ranging from 15 to 30 Hp, enabling the DNM to do in a single pass what many others do in three or more. Under test conditions, the DNM removes 26.4 inch3/min when face milling SM45C carbon steel, 42.2 in for GC25 gray casting, and 109 in for AL6061 aluminum.

For more information, please contact Doosan Infracore America at www.doosaninfracore.com.

# ► Ganesh Machinery Inc.

The VMC1814 weighs over 2-tons and features a heavily ribbed box-way construction to dampen cutting vibration for superior surface finish and improved tool life. With pre-tensioned double-anchored ballscrews and 40-block look-ahead in the FANUC control the VMC1814 is designed to generate precise programmed feature definition. The 12-HP spindle motor supplies spindle speeds up to 12,000 rpm. Axis moves are X=17.7", Y=12.4", and Z=15.7". Ganesh also builds full 5-axis contouring versions of their VMC's.

For more information, please contact Ganesh Machinery Inc. at www.ganeshmachinery.com.



# ► Haas Automation, Inc. The Super Mini Mill 2 from Haas Automation provides a

combination of high-speed capabilities, generous travels and compact footprint in a very affordable package. Despite its compact size, the Super Mini Mill 2 offers extended travels of f 20" x 16" x 14" (xyz), a 4" increase on each axis over the standard Haas Mini Mill. The Super Mini Mill 2 comes equipped with a 15-hp vector drive spindle that spins to 10,000 rpm, and a 40" x 14" T-slot table that provides plenty of room for multiple fixtures or a single- or dual-axis rotary table. Rapids are 1200 ipm, with cutting feeds of 833 ipm, and a high-speed 10-pocket tool changer is standard.

For more information, please visit Haas Automation at www.HaasCNC.com.



# ▲ Hardinge Inc.

Hardinge announces the newest member of the XR-Series of 5-axis family VMC's, the Bridgeport XR 300 5AX high-performance 5-axis vertical machining center. The 255 mm (10") diameter integrated dual-axis rotary table with 150-degree tilt and 5-arc second accuracy enhances the machine's flexibility and high precision machining capability. The ability to machine complex shapes, undercuts and difficult angles in a single setup reduces tooling cost and labor time, resulting in lower cost per part, in addition to maintaining parts conformity throughout production runs

For more information, please visit Hardinge Inc. at www.hardinge.com.



# **▼** Hurco

The Hurco 5-axis VM1oU gives job shops the 5-axis advantage they require at an economical price. The VM1oU combines efficient design with advanced technology. Design efficiency means the VM1oU has a small footprint with an extraordinarily large work cube. The integrated trunnion table design provides exceptional part clearances and larger part capacity. Advanced technology developed by Hurco gives VM1oU users a variety of smart software features that increase productivity and simplify programming of complex multi-sided parts.

For more information, please visit Hurco at www.hurco.com.



# product focus



# Mitsui Seiki

Mitsui Seiki's Vertex machine is suitable for ring gears from 1.5 to 16, and a special gear-making model incorporates a rotary trunnion table for the finish turning operations. "This machine can turn the gear faces, the final profile of the internal bore, and generate the gear teeth," says Mark Speier, Sales Engineer at Mitsui Seiki. Traditionally, manual gear hobbers or CNC gear cutting machines are employed, however compelling benefits are surfacing in certain applications using highly precise machining centers.

For more information, please visit Mitsui Seiki USA, Inc. at www.mitsuiseiki.com.

# ▶ Okuma

The Okuma MB-46V sets the bar for efficiency and utility when machining small parts. It provides an exceptional return on investment when producing small die/mold or production parts and for manufacturers in the medical, aerospace and firearms industries.

The compact construction, impressive thermal stability and zero table overhangs allow for tight tolerances and extreme accuracy. Available options include an automatic pallet changer and spindle speeds from 8K to 35K rpms. Extended X-axis travel is available on the MB-46VAE version.

For more information, please visit Okuma America at www.okuma.com.



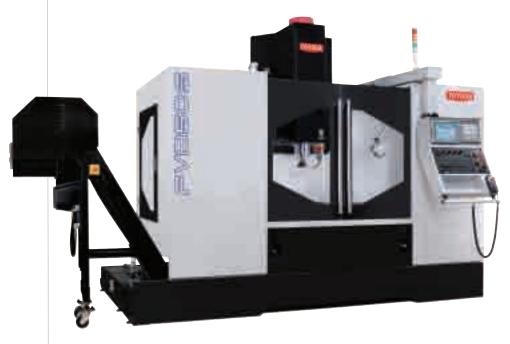




# ▲ Stama America

Stama America announces the introduction of its MC 526 Compact Series 3-axis vertical machining center which brings a variety of Stama features to the job shop in a standard machine that offers single or TWIN spindle efficiency. This powerful machining center offers a 15 kW, 96 Nm torque spindle drive to 10,000 rpm, 4000 N thrust in the X-Y axes, 8000 N in the Z-axis and rapid traverse of 147.64 ft/min in all axes. XYZ travel with a single-spindle is 39.37" x 15.75" x 14.17" and with a TWIN-spindle, 31.5" x 19.69" x 14.17".

For more information, please contact STAMA AMERICA at www.stama-america.com.



# ■ Toyoda Machinery

Toyoda Machinery is excited to announce the addition of two new high-speed linear way machines to its vertical machining line. Toyoda's FV850S and FV1050S high speed vertical machining centers rely upon an extremely rigid Meehanite cast iron base. This solid base offers higher density and uniform soundness over traditional cast iron, giving the casting greater tensile strength and maximum vibration-dampening capabilities. Rapid traverse rates reach 1890 ipm in the X- and Y- axes and 1417 ipm in the Z.

For more information, please visit Toyoda Machinery at www.toyoda.com.







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# postings



Noteable and newsworthy information and events for upcoming months.

# EUROMOLD

Exposition & Conference

Dec. 2-5

Frankfurt, Germany

www.demat.biz /euromold/ english/index.php

Pacific Design & Manufacturing Show

Anaheim, CA

Feb. 9th to the 11th

www.devicelink.com /expo/canondesignshows/

International Consumer Electronics Show

Las Vegas, Nevada

Dec. 2nd thru 5th

www.cesweb.org

# GREEN

Manufacturing Expo

Feb. 9th

thru 11th

Anaheim, CA

www.devicelink.com /expo/canondesignshows/ ICALEO

Intil Congress

Applications of Lasers & Electro-Optics

> Orlando, FL November 2nd to 5th

Thomas Edison electrocutes an elephant demonstrating dangers of alternating current

> Jan. 4. 1903

www.laserinstitute.org /conferences/icaleo/conference

# BEER

in cans first sold January 24, 1935 Erno Rubik

files for Hungarian patent for

Rubiks Cube Jan. 30, 1975 Birthday James Earl Jones

Signing of Vietnam Peace Accord Jan. 27,1973

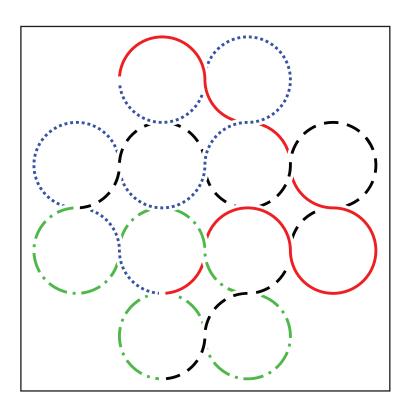
Jan. 17, 1931

November/December 2009

59

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

# think tank



# The Snake Cross

Among the four colored snakes (black, blue, green, and red), can you find the shortest one?

# Who Can Spot a Liar?

Jerry Levine, Chicago, Ill.; Al Bjork of Toledo Screw Machine Products in Rockford, Ill.; Ron May of Hunter Engineering Company in Bridgeton, Mo.; Paul Kuyt of ReSource Industries Inc. in Muskegon, Mich.; Roger Stillman of Metric & Multistandard Components Corp. in Hawthorne, N.Y.; Don Dimberio of X-Y Tool in LaOtto, Ind.; Mel Stark of NNT Corp. in Marshall, Wis.; Anthony Martellacci of Martellacci Machine Shop in Duncansville, Penn.; Greg Tetrick of Cass Screw Machine Products in Minneapolis, Minn.; Dave Triplett of Allied Machine & Engineering Corp. in Dover, Ohio; Bryan Burdine of AMS Production Machining, Inc.; Denise Gidaro of Ashby Manufacturing Company, Inc. in Cranberry Twp, Pa.; Jim Riddell of Baker College in Flint, Mich.; Chris Hoeker of International Tool and Machine in Hillside, N.J.; Dan Cibulskis of Aurora Air Products, Inc. in Aurora, Ill.; Mike Arnold of National Parts Corporation in Murfreesboro, Tenn.; John Lee of Keystone Dental, Inc. in Burlington, Mass.; Jack Hostutler of P.M. Machine in Willoughby, Ohio; Robert Pitts of Vallorbs

Puzzle found in the September/October 2009 issue



Jewel Company in Bird-In-Hand, Pa.; Ellen Laverty of Waterbury Screw Machine Products Co. in Waterbury Conn.; David Smith of Electroswitch Electronic Products in Raleigh, N.C.; Jeffrey Goodman of Eaton Steel Bar Company in Oak Park, Mich.; Sheldon Wheaton of Garmin International in Olathe, Kan.; Uli Kuster of Blaser Swisslube in Goshen, N.Y.; Kim Gardner of Comco Inc. in Burbank, Calif.; Steve Taylor of Global Shop Solutions in The Woodlands, Texas; James Siderits of MAG in Hebron, Kentucky; Mike Davis of LaserCut Machine in Dallas Texas; Robert Pitts of Vallorbs Jewel Company in Bird-In-Hand, Pa.; Bob Katzfey of Lee Precision in Hartford, Wis.; Joel Gray of Service Industries LLC in Rolling Meadows, Ill.; Wes Skinner of ManthBrownell, Inc. in Kirkville, N.Y.; Steve Arora of National Distribution. Inc.; Erik Hennie of Competitive Carbide in Mentor, Ohio; Pat Hanford of Towpath Machine Corp. in Cayuga, N.Y.





# NEW Threadmilling Attachment

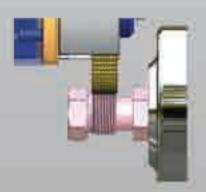
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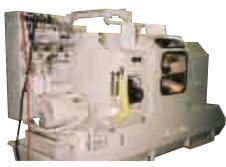








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# afterthought

# Finding Peace with Our Choices

The death of financier Bruce Wasserstein, a friend from college days, hit me like an unsheathed blow to the chin. It wasn't just because he had survived quadruple bypass surgery in 2001 or that he was three years younger than me and succumbed to heart failure. It was more about Bruce living the life of a superstar in finance, a master of the universe, a self-made Wall Street billionaire, who I knew from time spent working together on the University of Michigan college newspaper.

Those were heady nights of hot lead sliding out of linotype machines, wedged into heavy trays that turned into plates for the 3:00 a.m. printing.

Bruce wrote about the big issues, like student conflicts with the college administrators over divulging information to a Congressional witch hunting committee. It was Vietnam War time and the campus was alive with dissent; Bruce Wasserstein was smack in the middle of the controversy. I wrote about basketball, football and life, as the sports editor.

I remember Bruce coming up to me and saying, "Lloyd, what are you doing writing sports? Come over to the news staff and do something important."

That remark was a portend about how our lives would diverge over the next four decades.

Bruce was a brilliant guy, a chess player, oblivious to his personal appearance. Dan Okrent, a sports writer on my team at Michigan, who became an editor at *Time Magazine* and *The New York Times*, described Bruce as a "complete slob" in *The Michigan Daily* obituary. Bruce was usually the smartest guy in the room, even if it was a big room of very smart people—and he knew it.

Bruce graduated college at 19 and earned a law degree and MBA from Harvard at 23. He published a book about antitrust policy at 25.

If you had asked me at the University of Michigan what Bruce would do in his career I would have guessed he'd become an academic or a writer. He was fat, disheveled and blunt—not the qualities I would have associated with cashmere coated Wall Street bankers.

But Bruce from Brooklyn gravitated to the financial world, sort of cleaned up his style and started building his reputation as a brash, brilliant engineer of corporate mergers.

He used to lunch with former colleagues from *The Michigan Daily* who also ended up in New York. Before he started his own investment banking firm in 1988, Wasserstein and Perella, he told a friend in the group, "last year I made \$11 million, but this year I'm going to make some real money." He sold the company for \$1.2 billion.

So why did Bruce's death hit me so hard and linger with me? I think it's what Robert Frost wrote about in his poem, "The Road Not Taken." You reach a fork in the road of life and make your choice. Bruce went for the big money, the fast life, the Wall Street race. He divorced three times and had just married the rich, politically connected, 29-year-old, Angela Chao.

In a blog written by an old high school chum of Bruce's who became a foreign correspondent for CBS, Gordon Joseloff recounted meeting Bruce in Tokyo for dinner. Joseloff talked about his journalistic career and lamented his lack of wealth. Wasserstein retorted, "I made more money, but you had more fun."

We humans are programmed to compare ourselves whether it's about money, body dimensions or children. ??

As I consider my own career of buying and selling National Acmes, Conomatics and Greenlees, I don't know if I've had more fun than Bruce. I chose the family business and building a family. When he died Bruce was dedicating himself to concocting the strategy of Kraft's contentious takeover bid for Cadbury—a \$16 billion deal, and loving the action, I've been told

Bruce owned *New York Magazine* and other media properties. Reportedly, he had recently nibbled at *Business Week*. Bruce enjoyed journalism and he loved the printed word. Me, too.

We humans are programmed to compare ourselves whether it's about money, body dimensions or children. We want to feel good about ourselves in relation to our peers. I wonder if monks compete in meditation?

Bruce Wasserstein is dead at 61. I hope he was happy with his choices and success.

I hope I find peace with the choices I've made and continue to make.

Joy Dy

Lloyd Graff

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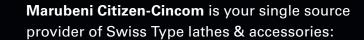
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