

W J T A

WaterJet Technology
Association



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Waterjet And The New Economy Of 2009

Could Ownership Or Use Of A Waterjet Affect The Future Of Your Business In 2009? *See article on page 2*



Waterjet maximizes material usage by cutting intricately nested parts out of 1 inch thick aluminium.

2009 American WJTA Conference And Expo

August 18-20, 2009 • Marriott Houston Westchase Hotel • Houston, Texas

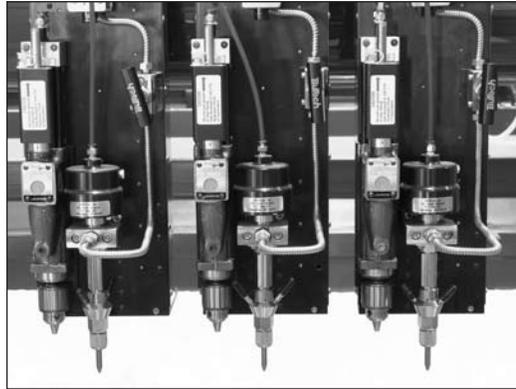
Details and registration information inside this *Jet News* issue

Could Ownership Or Use Of A Waterjet Affect The Future Of Your Business In 2009?

General consensus is 2008 was horrible from a business perspective. We could fill pages of all the bad things that happened. Yet there are companies constantly that ask “what problems?” There are businesses that are so buried with work they don’t know where to turn. It would be great if we all had this issue. So how do we maneuver our companies into that position?

Using a waterjet will not open the floodgates, but it could well change the way you think, plan, structure and design almost everything you do. Waterjet cutting has so few boundaries that one is genuinely freed to use your imagination to the full.

Since its inception, waterjet cutting has come a long way. The attained goal to make the waterjet cutting process easier to use in software, operation of controllers, ease of service and extended life of consumable parts has seen the demand for waterjets increase. But now there is even more. An open architecture design of building and thinking how to use additional processes all mounted onto the waterjet gantry is opening more doors than ever before. Imagine being a sign shop for example. You



need to make some aluminum signs where the waterjet will be ideal for the cutting of the logo and lettering. But each part has tapped holes that receive studs into the back of the part. The studs will then be used for mounting the sign to the wall. This is automatically a 2-stage process. The design needs to be cut and then the tapped holes machined into the material. With the new options available with some systems, all this can now be done in one program, with no need to remove the material from the waterjet table till it is completed. And this is just a simple example.

WARDJet Inc., a waterjet manufacturer in Ohio whose motto is “WARDJet... Not Just A Waterjet,” has customers who are using three waterjet cutting heads mounted on one cross beam to cut three holes

simultaneously through 1.125” thick armor plating. Then the holes are reamed to ensure the ID of the holes are perfect. All three holes are then tapped simultaneously with a tapping device mounted on each of the Z carriages. Counter sinks, marking, surface finishes and many other procedures are available. Each process can be run inside a single program. Automatic loading and unloading, bar code inventory tracking and countless other opportunities are there for the taking. And the limit is not three heads. The same machine design has some units with 15 cutting heads mounted on one cross beam. This is serious expandability!

“We want our customers to be able to daydream about automation in their shop, including simple assembly of parts using the WARDJet system. We can run 32 axis of simultaneous motion from the controller, so any combination of rotating axis, loading, unloading, drilling, tapping, multiple 5-axis cutting machining and shaping, are all possible, including integrating a tool changing unit for additional automation and reduced manual input. Unlimited sensing using light or touch, visual recognition systems and an optional built-in equivalent of CMM to verify final part accuracy after cutting is the way of the future. And all this is nothing without 100% remote access for control, service and management,” says Richard Ward, founder of WARDJet Inc.

And certainly this kind of thinking is contagious. It might well become mandatory for survival in the

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*Charlie Underwood, Operations Manager
Midwest Waterblasting, Clinton, MI*

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Flow Announces It Will Not Acquire OMAX Corporation

Flow International Corporation has announced that it will not exercise its option to acquire OMAX Corporation.

Charley Brown, president and CEO of Flow says, "After a thorough review of our financing alternatives, and discussions with OMAX Corporation about modifying the terms of the transaction, we have decided that acquiring OMAX would be excessively dilutive to Flow shareholders."

Flow and OMAX agreed on March 10, 2009, to amend the terms of their merger agreement changing Flow's opportunity to acquire OMAX from an obligation to an option exercisable by Flow, and agreeing to a release of merger related litigation if the acquisition did not close. Flow anticipates charges consistent with its previous disclosures in connection with its decision not to complete the transaction.

Discounted Airfares Through Jet Blue For 2009 WJTA Conference And Expo

WJTA has arranged with Jet Blue a special 5% discount off Jet Blue airfares booked online at www.jetblue.com/promo. If Jet Blue flies from your city, visit www.jetblue.com/promo, and enter WJTA group code WJTA09 and check flight information.

Airline prices in general have been coming down. If you already booked your flight, you may be able to rebook at a lower fare. Check with your travel agent, the airline web sites, or reseller websites (e.g. Orbitz).

OMAX Announces Settlement In Patent Litigation

OMAX Corporation has announced the settlement of the outstanding patent litigation with Flow Corporation, along with the cessation of merger negotiations with the company.

"Due to the risks and difficulties of obtaining financing inherent in today's capital markets, Flow elected to abandon the proposed merger between our companies," says Dr. John Cheung, CEO of OMAX. "While we still believe the merger could have provided significant benefits for both companies, OMAX was unwilling to further modify the terms of the merger agreement. OMAX is emerging from this process with a very strong financial position."

In consideration for Flow's termination of the merger and the patent settlement, OMAX will receive \$25 million in cash and \$10 million in notes maturing in four years. A cross-licensing agreement has been reached for the patents involved in the litigation.

"No commercialized technology was exchanged between OMAX and

Flow, so we will retain complete ownership of the innovations that have made our company an industry leader," says Dr. Cheung. "The technologies exclusively available in OMAX waterjets include Intelli-MAX[®] control software, direct drive pump technology and Intelli-TRAX[™], the world's first drive system designed exclusively for waterjet machining centers."

OMAX has also announced the establishment of MAXIEM[™], a new division and brand within the company. With full technical details forthcoming, MAXIEM machines will debut during the summer of 2009 and offer the unparalleled flexibility and productivity of waterjet machining at a highly affordable price point.

"Having penetrated markets in over 40 countries, we have identified a significant global need for a basic line of waterjet machines," says Dr. John Olsen, co-founder and vice president of operations at OMAX. "Through extensive R&D, we developed the MAXIEM line of machines to provide proven technologies in a highly productive, cost-efficient package."

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Could Ownership Or Use Of A Waterjet Affect The Future Of Your Business In 2009?, from pg. 2

aggressive manufacturing environment we all find ourselves in.

Let's take a step back for an overview of waterjet cutting. The process of waterjet, although not the fastest or ideal process for cutting and working each material, is unique in that it will cut almost everything. Certainly there are areas where waterjet is the ideal process. However, when comparing waterjet with laser cutting of thin steel sheet, the laser will outperform the waterjet. So if you have large volumes of work in thin steel, don't buy a waterjet. However, if you are looking at a range of materials to cut, from shim stock, to 10" thick stainless, to gasket materials, to the foam packaging of tools, waterjet is the way to go. Overall the advantage of having this incredibly versatile tool in house can reduce your dependence on others. Whereas bringing all work in house is not always a good thing, a waterjet is so versatile, that it is one tool that won't take long till nearly everyone in the shop will need something processed on the unit.

Add to this the multiple functionality of all the other processes other than waterjet cutting on a CNC gantry, and you might well be wondering how one machine will meet all your needs. Of particular interest WARDJet is building a 30' x 13' system, with the exact same design as their R-Series range of waterjets, but this one is different in that there is no waterjet on the system. There are so many other processes that are available that the machine does not have a waterjet on the unit, although a waterjet can be added to the system at any time. One of the features of the unit is the

replacement of gaskets typically cut out of rubber compounds. The unit will dispense a silicone bead onto the parts, saving material, time and cost. The machine will also be doing some assembly of parts. Typically this kind of versatility can only be gained by spending large amounts on large gantries. However, volumetric mapping of the position of the tool over the entire working envelope of

the system, allows a flood of initiative and ways to change traditional methods of building equipment.

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(continued on page 19)

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Custom Jettool® Waterjet Improves Fit, Finish Of Industry-Leading Boats

In its first 41 years, innovation and technological advancements have been a staple of Ranger Boats' legendary reputation. In an increasingly competitive industry, Ranger has set the bar once again, this time through an efficient and resource-conscious manufacturing process made possible with the addition of a custom JetTool® waterjet built by KMT Robotic Solutions.

Much in the same way that the RoadArmor® system revolutionized the RangerTrail division of the boat company and pultruded fiberglass changed the way transoms were built and components reinforced, the new robotic waterjet will fulfill one of the factory's least-popular jobs: cutting holes and lids into the fiberglass, interior deck components of the more than 40 different Ranger models.

"In the past, these interior deck compartments were trimmed by some of the hardest-working men and women in the factory – each dressed head-to-toe in protective gear – working with a variety of jigs and making the cuts with routers, saws and drills," said Ranger Boats President Randy Hopper. "It was a difficult job that generated a lot of fiberglass dust. With the new robotic waterjet everyone benefits: fellow employees get a cleaner work environment and the cost savings from improved efficiency help offset the rising cost of raw materials and the initial equipment investment."

The process begins once the boats are wheeled into the robotic waterjet's booth. Following an introductory calibration process where the machine uses lasers to measure the precise placement of the cutouts, the robotic

waterjet forces water at 60,000 psi through a near-microscopic nozzle opening, resulting in clean, uniform cuts. The jet trims the interior deck on each Ranger model, including all hatch and storage openings, precisely locating and drilling for deck hardware. Confined within its 675 square-foot booth housed inside the 364,000 square-foot production facility, this advancement in boat building results in a cleaner work environment for employees and an improved product for the consumer.

The difference in results between robotic water jet trimming and conventional boat-building methods are vast. For the consumer, the edges of compartments underneath the deck that house batteries, breakers and pumps are smoother and offer a level of quality not seen with conventional methods. When removing mounting plates on the front deck to install electronics, the cutouts are uniform and do not impede wiring. For the manufacturer, water jet cutting means improved production times - as well as a significant savings in energy, maintenance and tool-making costs.

"There will be substantial annual savings each year in perishable tooling," said Lance Newton, Ranger Boats' engineering project manager. "As our process becomes leaner, not only with the robotic trimming system but with other processes as well, it results in decreased manufacturing



costs for Ranger, which can ultimately result in a more stable cost to our dealers and customers from year to year."

For more information, visit www.kmtgroup.com/robotic.

The *Jet News* is published by the WaterJet Technology Association (WJTA) and is a benefit of membership in the Association.

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Jet Edge Celebrates 25th Anniversary

Jet Edge, Inc., a leading manufacturer of industrial waterjet cutting and surface preparation systems, is celebrating its 25th anniversary in the waterjet industry in 2009.

Jet Edge entered the waterjet industry in 1984 as a manufacturer of 55,000psi waterjet intensifier pumps for precision water jet cutting and 36,000psi waterjet pumps and portable equipment for mobile waterjet cutting, cleaning and surface preparation applications. Jet Edge began manufacturing precision waterjet cutting tables in 1998. In 2007, it became one of the first waterjet manufacturers to offer a 90,000 psi waterjet intensifier pump, which increases productivity by 40-50% for many materials and reduces operating costs by as much as 40%.

Jet Edge waterjet systems are used around the world by a wide variety of industries, including aerospace and defense, automotive, petrochemical, energy and general manufacturing. Jet Edge precision waterjets cut virtually any material, from metals and stone to carpet, foam and even food. Jet Edge's waterjet surface preparation tools are used for paint, coatings and corrosion removal, and Jet Edge mobile waterjet cutters are primarily used to cut pipelines, steel reinforced concrete, reactor vessels and fabricated metal structures. They are ideal for cutting where flames and heat are restricted.

"Jet Edge's success over the past 25 years can be attributed to our phenomenal customer loyalty and our company-wide dedication to providing quality products and outstanding customer support," said Jude Lague, Jet Edge president. "We are very

proud of the fact that 97 percent of our customers say they would buy from Jet Edge again. That speaks volumes of our products and our employees."

For more information about Jet Edge, visit www.jetedge.com, call 1-800-538-3343 or e-mail sales@jetedge.com.

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**New Session
on OSHA's Combustible
Dust Program**

Boot Camp

August 19-20, 2009

Preliminary Schedule

WEDNESDAY, AUGUST 19

- | | |
|------------|---|
| 10:30 a.m. | Electrical Safety
Alan R. Browne, Stewart R. Browne Mfg. Co., Inc. |
| 11:30 a.m. | DOT Regulations for Trucks/Trailers
Dan Hoffman, DOT Commercial Vehicle Enforcement Officer, LaPorte, TX, Police Department |
| 1:00 p.m. | Proper Inlet Pump Suction Conditions
Jamie Forrest, NLB Corp. |
| 2:00 p.m. | Safety in Waterjetting
Ed Twaddell, TurtleSkin Protective Materials |
| 3:00 p.m. | Introduction to High Pressure Waterblasting
Gary W. Toothe, G.W. Training |
| 4:00 p.m. | Cutting Edge Quality in Abrasive Waterjet Cutting
Axel Henning, OMAX Corporation |

THURSDAY, AUGUST 20

- | | |
|------------|--|
| 9:30 a.m. | Target Safety: Reducing Specific Hazards
Dennis Cobb, Conoco Phillips Contract Safety Group |
| 10:30 a.m. | Hose Fittings, Pressure Testing
Paul Webster, Parker Polyflex |
| 11:30 a.m. | Choosing a Contractor
Roger Burwell, Plastics Division Makrolon/BPA, Bayer Material Science LLC |
| 12:30 p.m. | Hydro-Excavation
Neil McLean, Hydro-Excavation Consultant |
| 1:30 p.m. | NEW Get A Bang For Your Buck, Not From Your Truck
The Impact of OSHA's Combustible Dust National Emphasis Program On Industrial Vacuuming
Gary W. Toothe, G.W. Training |

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Candidates Sought For 2009 WJTA Awards

You are invited to submit candidates for the special awards that are presented biennially by the WaterJet Technology Association to honor a company, organization or individual who has made a significant contribution to the industry through accomplishments that directly enhance waterjet technology and the industry as a whole. A list of previous WJTA award recipients appears below.

Candidate nominations must be received no later than July 3, 2009. The award recipient(s), to be selected by the Awards Committee of the WaterJet Technology Association, will be honored at a presentation ceremony on Wednesday, August 19, 2009, in conjunction with the 2009 American WJTA Conference and Expo in Houston, Texas.

An official form for candidate nominations appears on the right. Complete one form for each nomination submitted. Please make additional copies of the form as needed. Completed nomination forms may be faxed to (314)241-1449 or mailed to the WaterJet Technology Association, 906 Olive Street, Suite 1200, St. Louis, MO 63101-1448, USA.

2009 WJTA Awards Nomination Form

Candidate _____
 Company _____
 Address _____
 City _____ State _____
 Country _____ Postal Code _____
 Telephone _____ Fax _____
 Email _____

Candidate Submitted by _____
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Nominations must be received no later than July 3, 2009
For a prompt response, fax completed form to 314-241-1449, or mail to WJTA, 906 Olive Street, Suite 1200, Saint Louis, MO 63101-1448

Previous Award Recipients

1981 Pioneer Award
Jacob Frank

1983 Pioneer Award
H.D Stephens

1985 Pioneer Award
William Cooley

1987 Pioneer Award
Norman Franz, Ph.D.

1989 Pioneer Award
Richard Paseman

1991 Pioneer Award
John H. Olsen, Ph.D.

1993 Pioneer Award
Fun-Den Wang, Ph.D.,
Safety Award
David Summers, Ph.D.
NLB Corporation
Service Award
George A. Savanick, Ph.D.
Mohan Vijay, Ph.D.
Technology Award
Mohamed Hashish, Ph.D.
Autoclave Engineers
Hammelmann Corporation

1995 Pioneer Award
George Rankin
Safety Award
Autoclave Engineers
Service Award
Thomas J. Labus
Technology Award
Thomas J. Kim, Ph.D.

1997 Pioneer Award
David A. Summers, Ph.D.
Service Award
Andrew F. Conn, Ph.D.
Technology Award
Prof. Dr-Ing. Hartmut Louis

1999 Pioneer Award
Mohamed Hashish, Ph.D.
Safety Award
Bruce Wood
Service Award
John Wolgamott
Technology Award
Ryoji Kobayashi, Ph.D.

2001 Pioneer Award
George A. Savanick, Ph.D.
Technology Award
Richard Ward

2003 Pioneer Award
Pat DeBusk
Service Award
Mohamed Hashish, Ph.D.
Technology Award
Ernest S. Geskin, Ph.D.

2005 Pioneer Award
Hartmut Louis, Dr.-Ing.
Safety Award
TurtleSkin WaterArmor
Service Award
NLB Corporation
Technology Award
Jay Zeng, Ph.D.

2007 Pioneer Award
Forrest Shook
Safety Award
Vacuum Equipment Safety
Committee
Service Award
Tony Fuller
Jim Petillo
Technology Award
Mamidala Ramulu, Ph.D.

Fundamental Aspects In Waterjet Cleaning

Louis and Schikorr* wrote an article back in 1982 to address some fundamental issues in waterjet cleaning. The article still has a great reference value today. Here a review of the article.

The article started with listing out 15 typical waterjet cleaning applications. It also sorted out the types of applications by the types of substrates and layers to be removed. Characteristics of substrates were described in detail. Two noted characteristics of metal substrates are "Wöhler behaviour" (fretting) and corrosion. Layers were classified into organic (naturally grown and artificial) and inorganic types. The characteristics of each type of layer were also described in detail. The mechanisms (mechanical, specific, and chemisorption) of adhesion were also discussed.

The article also talked about two types of free jets: round and flat. Both types are fully turbulent and they disintegrate into small fluid particles shortly after they leave the nozzles. Flat jets have a higher tendency of disintegration than the round jets.

A continuous jet flowing perpendicular to the target surface produces a normal force as well as a shearing force that is parallel to the surface. In the case that the jet is hitting a kerf, the flow will change direction and a large portion of the kinetic energy will be converted into pressure, which could open up a crack. In reality the jet becomes a stream of small fluid particles which could produce pulses of impact pressures multiple times of the steady-state pressure. A high temperature in the jet is helpful in removing layers consisting of oil and grease.

Regarding the layer removal process in waterjet cleaning, the authors

suggested that crack formation is necessary for removing a hard and/or brittle layer and dynamic loading (impact) is preferable. For ductile types of layers, a high impact speed is preferable because a ductile material

will become more brittle with higher impact speeds. For viscous and viscoelastic layers (bitumen, chlorine-caoutchouc, oil-grease), a quasi-static load is sufficient and a higher temperature of the jet is helpful.

(continued on page 22)



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Michael Waltrip Racing Increases Waterjet Productivity 35%, Cuts Costs 30%

Michael Waltrip Racing (MWR) reports that it has experienced dramatic waterjet cutting productivity gains and cost reductions since powering its Jet Edge waterjet system with Jet Edge's 100hp 90,000 psi X-Stream waterjet intensifier pump in January.

"We've been seeing, across the board, a 35% improvement in cutting speed, plus we are using about 25% less garnet abrasive, and we have reduced our costs by 30%," says Nick Hughes, MWR's technical director. "As an example, our spindles, which are one of our more complicated steering parts and cut from 2" 4140 steel, used to take 50-55 minutes to cut at 60,000 psi. Now we are cutting them in 30-44 minutes. Before we got the waterjet, it used to take three or four hours to rough cut them on a bandsaw. I also should note that about the same time we upgraded our pump, we changed suppliers for our spindle blanks. They use a much harder material that requires a slower cutting time. The X-Stream offset the increased cutting time.

"Another good example of a reduction in machining time would be our upper control arm plates that attach our front suspension arms to the chassis. These are cut from 1.5" thick steel and took about 1 hour and 25 minutes to cut two with the double heads and the old 60Kpsi pump. We can now cut two in about one hour with the double heads and the 90Kpsi pump."

Thanks to these increased cutting speeds, MWR has been able to reduce its waterjet operating hours from 60 to 65 hours per week to 40 to 50 hours per week, saving on labor and overhead, Hughes notes.

"From a throughput standpoint, we're able to push a lot more product through in the same period of time," he says. "This has freed up machine time so we can cut jigs and fixturing in addition to racecar parts. We're able to rough these out on the waterjet much faster than with conventional cutting tools."

By freeing up production time, Jet Edge's X-Stream waterjet pump also has helped MWR develop a side business building cars for other race teams, Hughes adds.

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Recommended Practices Seminar for the Use of Industrial Vacuum Equipment

Tuesday, August 18, 2009

Preliminary Schedule

7:30 a.m.-8:00 a.m.	Registration
8:00 a.m.-9:00 a.m.	Overview of Vacuum Trucks and Components – Static Display of Trucks Onsite By: <i>Phil Stein and Gary Toothe</i>
9:00 a.m.-9:30 a.m.	Break
9:30 a.m.-11:30 a.m.	Understanding the Power of Vacuum and How Industrial Vacuum Loaders Work By: <i>Phil Stein</i> Guzzler/Vactor Manufacturing Inc. Streator, Illinois
11:30 a.m.-12:30 p.m.	Lunch
12:30 p.m.-2:30 p.m.	Getting the Most Out of Your Air Mover By: <i>Gary W. Toothe, Training Manager</i> G.W. Training Sumter, South Carolina
2:30 p.m.-3:30 p.m.	Electrical Safety Issues By: <i>Ravel Ammerman</i> Colorado School of Mines Division of Engineering Golden Colorado
3:30 p.m.-3:45 p.m.	Break
3:45 p.m.-4:30 p.m.	"Ask the Experts" Panel With Ravel Ammerman, Phil Stein and Gary Toothe

M & M Cut-O-Matic Attributes Steady Growth to Waterjet Cutting Technology

During the past four years, Downey, California's M & M Cut-O-Matic, Inc., has seen its industrial cutting business grow 10-30% per year even as other businesses struggle to maintain flat sales.

M & M's A.J. Martin attributes his company's continued success to its decision to add waterjet cutting technology to its long list of cutting capabilities. M & M has two waterjet cutting systems, including a 4' x 8' Jet Edge High Rail Gantry waterjet and a 6' x 12' system built by a manufacturer that has since left the waterjet business.

"We got our waterjets to broaden our capabilities in the cutting industry," Martin explains. "Our business has grown every year since we added the waterjets, and we are still keeping

busy. Another thing that sets us apart is our quick turn-around time and same-day service. We have customers that we have gained as long-term customers because of our quick turnaround. Our waterjets have made our delivery even faster by increasing our productivity."

Family owned and operated by the Martin family since 1963, M & M is a leading provider of saw and waterjet cutting services. In addition to its two waterjets, M & M has several bandsaws and cut-off saws. The company provides production cut-off sawing on up to 18" square or round materials up to 20' long, block sawing of materials 1/4" to 15" thick, circle sawing, contour sawing, mitre sawing of 0 to 45 degrees, bundle cutting, and



A.J. Martin, M & M Cut-O-Matic, and his Jet Edge High Rail Gantry. The company uses a closed-loop filtration and water recycling system that reduces water consumption and eliminates the need to dump water down the drain, essential in Southern California's desert environment. Photographs courtesy of Jet Edge.

plate sawing for materials up to 10" thick and 20' long.

(continued on page 18)

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Flow Announces New North American Distributor Network

Flow International Corporation recently announced that it has established a network of new distributors, building the foundation of a new channel of distribution to complement its direct sales channel.

Flow reached agreements with some of the top North American distributors of machine tools. As waterjets continue to find acceptance in manufacturing facilities and fabrication shops, these dealers will provide local application, showroom, sales, and customer support in many of the industrial centers of North America.

Within the United States, the newly signed distributors are Capital

Machinery Technologies, Ellison Machinery Company, Fox Machinery Associates, Gladwin Machinery & Supply Company, and Modern Machinery Company. In Canada, Flow reached agreement with Modern Tool, Wallace Machinery and Tool Company, and Westway Machinery.

Global EDM Supplies Inc., a leading provider of EDM supplies and technical expertise, also was recently added as a Flow distributor of the WaterjetConnect brand of waterjet consumables and spares for the general waterjet market. "We are excited about the local sourcing option companies with EDM and waterjet systems now have for service parts

for both systems," says Mark Powell, Flow's manager of aftermarket sales.

"Flow is pleased to work with some of the finest machine tool dealers in North America," says Jeff Hohman, EVP and general manager, Flow International. "Waterjet technology is ideally suited for manufactures of all types. This new network allows them to access our technology and deal with people they already have trusted relations with. We look forward to the increased market penetration they will provide and the resulting increased awareness of waterjet capabilities."

For more information, visit www.flowcorp.com.

Recommended Practices Under Review

A subcommittee of the WJTA Safety Committee has been formed to review and update the *Recommended Practices for the Use of Manually Operated High Pressure Waterjetting Equipment*. In addition to a review of the current content, the committee will also discuss a new section that will address recommended practices for the use of automated waterjetting equipment.

Please submit your comments or suggestions for revising the *Recommended Practices* to: WJTA Safety Committee, 906 Olive Street, Suite 1200, St. Louis, MO 63101-1448, phone: (314)241-1445, fax: (314)241-1449, email: wjta@wjta.org, website: www.wjta.org.

Flow, KUKA Robot Group Announce Strategic Alliance

Flow International Corporation, a leading developer and manufacturer of ultrahigh-pressure (UHP) waterjet technology, recently announced the formation of a strategic alliance with KUKA Robot Group, a global leader in robotic automation.

The relationship couples Flow's abrasive waterjet machining expertise with KUKA's long-standing expertise in precise robotic manipulation to benefit manufacturers seeking increased production requirements.

"This alliance between Flow and KUKA helps assure we address the important production and advanced segments of our marketplace," says Charley Brown, president and CEO of Flow. "This expands our process and robotic applications."



Stuart Shepherd, president of KUKA (left), and Dick LeBlanc, executive vice president, Advanced Systems Business (right).

"KUKA is honored to be selected by Flow to provide high accuracy robotic technology for the future growth of robotic waterjet cutting applications," says Stuart Shepherd, president of KUKA.

For more information, visit www.flowcorp.com.

Jetstream Announces Relocation To New Facility In Houston

Jetstream of Houston, manufacturer of high quality waterblasters, parts and accessories, has announced the relocation of its headquarters and manufacturing to larger facilities in Houston. The move to the new 42,000 square-foot facility was mandated by business growth and the need for upgraded and larger manufacturing space. Located at 5905 Thomas Road in Houston, Jetstream's new headquarters is approximately four miles west of their previous 23,000 square-foot facility, which the company occupied since 1985.



“Our commitment to providing world-class service to our expanding customer base has forced us to seek larger, more modern and more cost-efficient office and manufacturing space that better fits our business model,” says Bill Krupowicz, vice president and general manager of Jetstream. “The move to our new facility is in direct response to our customers’ need for faster lead times. We now have the room needed to improve our workflow and inventory management, and to add capacity for future growth.”

Krupowicz said the company considered several factors during the selection process for the new location, including proximity to their previous facility for retention of their current workforce, the availability of business services and better access to the Sam Houston Tollway, a main artery around the city of Houston.

“We have an unmatched pool of skilled talent here at Jetstream, so it was important for us to stay within the general Houston area,” Krupowicz says. “Our new facility is about a half-mile away from the tollway, so it’s also much more convenient for our customers for will-call parts pick-up.”

Krupowicz says the new facility increases Jetstream’s internal capabilities, while reducing

lead time requirements. “With the additional space we now have, we’ll be able to produce rigid tube cleaning lances up to 35 feet in length in-house,” he says. “Customers will also benefit from our new training space and a 1,000 square-foot product display area.”

According to Krupowicz, the new Jetstream facility also features a more productive yard environment for truck pick-ups/deliveries and loading units on flatbeds for shipments. “We installed a new 10-ton overhead crane which will provide a more efficient process for moving equipment,” he says. For reduced utility bills, the manufacturing plant features passive lighting and an advanced climate-control approach.

Jetstream, a division of Federal Signal Corporation’s Environmental Solutions Group, manufactures industrial high-pressure waterblasting equipment operated at pressures up to 40,000 psi for a wide range of applications, including industrial cleaning and surface preparation. Product offerings include a complete line of skid- and trailer-mounted pump units, control guns, valves, hoses, replacement parts and nozzles. For more information, visit www.waterblast.com.



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Waterjet Unit Can Operate At 8,000 Psi To 40,000 Psi

A new generation of the NLB 225 Series convertible waterjet units expands its range of operating pressures to 40,000 psi and improves ultra-high pressure reliability and accessibility for maintenance. The NLB 225 Series now offers the widest pressure range in the industry: 8,000 psi, 10,000 psi, 12,000 psi, 15,000 psi, 20,000 psi, 24,000 psi, or 40,000 psi.

Conversions require a simple kit and most can be completed in about 20 minutes. The conversion to 40,000 psi takes about 30 minutes. Customers who already have an NLB 225 unit can add the 40,000 psi capability with a conversion kit instead of buying a new unit.

Each unit in the NLB 225 Series is available with a choice of heavy-duty diesel engines — 200 hp, 230 hp, 275 hp, or 300 hp. Flows range from 6 gpm to 82 gpm. The NLB product line now includes 27 convertible high-pressure waterjet units, providing users with more models, pressures, flows, and horsepower choices than any other manufacturer.

NLB Corp. is a leader in high-pressure and ultra-high pressure water jet technology. The company manufactures a full line of quality waterjetting systems and accessories for contractor and industrial uses,



NLB 225 Pump

including surface preparation, coatings removal, pavement stripe and rubber removal, tank and tube cleaning, concrete hydrodemolition, concrete and pipe cutting, and more. For more information, visit www.nlbcorp.com or call (248) 624-5555.

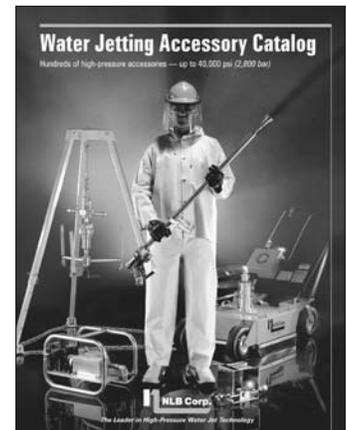
NLB Updates Water Jet Accessory Catalog

The latest edition of the NLB accessory catalog introduces a variety of new waterjet tools for pipe cleaning, pavement marking removal, and other applications. The 102-page catalog can be requested at no charge from NLB, or an on-line version can be downloaded from the company's website, www.nlbcorp.com.

Among the new accessories are Typhoon™ self-rotating nozzles, for cleaning pipes and tubes from 5/8" to 50" (1.6 to 127 cm) in diameter, and a new 40,000 psi (2,800 bar) SPIN-NOZZLE® head. New system valve rebuild kits feature a cartridge-style seal that can be changed in 60 seconds, like the one in NLB lances and foot controls. The catalog also introduces the STARJET-PLUS™, an automated pavement maintenance system with many new features that significantly improve productivity.

Like previous NLB accessory catalogs, the 2009 edition includes a comprehensive couplings and fittings section and a reference section with hook-up drawings, nozzle flow charts, thrust and pressure drop tables, and English/metric conversions.

For more information, visit www.nlbcorp.com or call (248) 624-5555.



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Flow Appoints Allen Hsieh VP, CFO

Flow International Corporation has announced the appointment of Allen Hsieh as vice president and chief financial officer. Hsieh will oversee all of Flow's financial functions from the company's headquarters in Kent, Washington and report directly to Charley Brown, Flow's president and CEO. Hsieh joined Flow on December 4, 2008, when he was appointed interim CFO.



Allen Hsieh

"Allen has proven himself to be a very effective addition to our executive team, and we welcome

his experience and leadership," Charley Brown says. "Allen will play a strategic role as we continue to position the company for growth and return value to our shareholders."

From 2003 to 2007, Hsieh was with InfoSpace, Inc., a publicly traded provider of online and mobile media products and services, most recently as chief financial officer. From 2000 to 2003, Hsieh was vice president of finance at Terabeam Corporation, a provider of broadband wireless technology equipment and services. He was with PricewaterhouseCoopers LLP from 1985 to 2000, where he was a partner beginning in 1998. Mr. Hsieh has a B.A. in Business Administration from the University of Washington.

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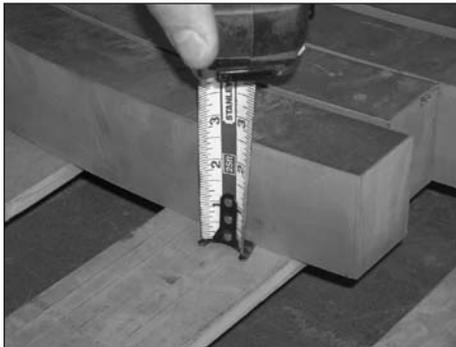
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M & M Cut-O-Matic Attributes Steady Growth to Waterjet Cutting Technology, from page 13

M & M has 12 employees, including two waterjet operators. They run their waterjet systems 10-12 hours a day, plus two or three Saturdays per month.

With its waterjet cutting machines, M & M is able to cut virtually any material with a stream of water that has been pressurized up to 60,000 psi and mixed with garnet abrasive. M & M waterjets a variety of materials from titanium to copper, marble and plastics. It has waterjet-cut materials up to 10" thick, including 5 1/2" titanium and 6" steel. It maintains a tolerance within $\pm .005$ ".

Martin says his waterjet systems have helped him save time and money by allowing him to cut faster and to tightly nest parts, which reduces scrap and increases productivity.



M & M Cut-O-Matic cuts a 3" thick inconel part for a power turbine that will run for one year without maintenance. Photograph courtesy of Jet Edge.

As an example, M & M can now cut 6" strips from 96" x 240" quarter-inch sheet steel in two hours versus two to three days on a plate saw. In addition, a 3" thick stainless steel part that used to take a day or two to cut manually on a saw can now be cut in two to three hours on the waterjet.

Waterjet technology also has enabled M & M to take on a number of tough projects that would have been impossible or cost-prohibitive

to cut using conventional cutting methods. One of the company's toughest jobs was waterjet cutting 12" x 12" windows in 30" diameter, 60" long steel pipes that are used in temporary event lighting systems at a New York state park.

M & M has cut 5 1/2" thick titanium landing gear parts for Boeing and suspension parts for an off-road racing team. It also has provided architectural cutting services to several Las Vegas hotels, and has waterjetted parts for the railing on the San Francisco pier, cut the ESPN Zone signs at Staples Center in Los Angeles and cut hundreds of aluminum parts for an aluminum company's statute in Dubai.



M & M cuts off-road racecar suspension parts for Terrible Herbst, a racing team out of Las Vegas. Photograph courtesy of M & M Cut-O-Matic.

For more information, visit www.jetedge.com, call 1-800-538-3343, 763-497-8700 or e-mail sales@jetedge.com.

Michael Waltrip Racing Increases Waterjet Productivity 35%, Cuts Costs 30%, from page 12

"The X-stream has opened the door for more commercial opportunities," he says. "It helps bring the cost down and we're able to pass that down to the other teams. They are able to get a quality product at a lower price plus they can leverage off of MWR's engineering and manufacturing capabilities."

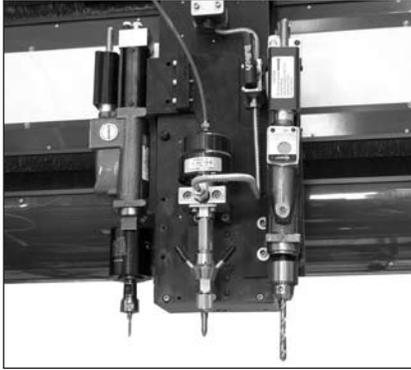
According to Hughes, MWR waterjets 250 parts for each of its racecars. The parts are cut from a wide variety of materials ranging from 1/4" Nomex® to 1/2" steel, and include numerous panels, mounts and chassis components, plus duct work, windows, splitter panels and much more. MWR builds about 56 cars per year,

including the #55 NAPA AUTO PARTS Toyota Camry driven by Michael Waltrip and fielded by MWR, the #00 Aaron's Dream Machine Toyota Camry driven by David Reutimann and fielded by MWR, the #47 Little Debbie® Toyota Camry driven by Marcos Ambrose fielded by JTG- Daugherty Racing through a technical alliance with MWR, and the NASCAR Nationwide Series #99 Aaron's Dream Machine.

For the latest updates on Michael Waltrip Racing's use of the Jet Edge waterjet system, and for more information about Jet Edge, visit www.jetedge.com, call 1-800-538-3343 or e-mail sales@jetedge.com.

Could Ownership Or Use Of A Waterjet Affect The Future Of Your Business In 2009?, from pg. 5

in three dimensions, allow simple actions like traditional layout and marking to be replaced with CNC processes.



Most waterjets are built to be waterjets only. And if all you are looking for is to have parts waterjet

cut, that is fine. The vertical upward force in reaction to the stream is minimal, as are any lateral forces on the cutting head. The weight of a cutting head is also low. As a result a waterjet built specifically for the sole purpose of waterjet cutting tends to be light in every way. Many waterjets are built specifically to only cut with one head using a cantilever design with only two motors, one for the X and one for the Y axis motion. Cantilever designs require squareness to be mechanically adjustable as opposed to a bridge style machine with three motors, where squareness can be compensated for electronically. Cantilever designs are often limited in the load they can carry before bending, deflecting and suffering torsion to the point accuracy is affected.



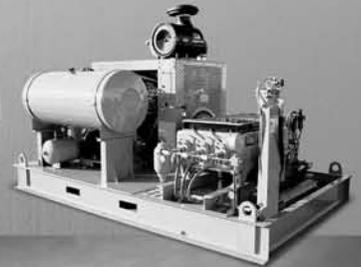
Many bridge designs are also built to be very light for waterjet cutting just like the cantilever counterparts, so simply going for a bridge design is not enough if you are looking to add other processes. For a machine to be able to add drills, tapping systems, height sensors, crash sensors, 5-axis cutting

(continued on page 20)



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Waterjet Technology: Basics and Beyond

Tuesday, August 18, 2009

Preliminary Schedule

WATERJET TECHNOLOGY – THE BASICS

8:00 a.m.-8:30 a.m.	Registration
8:30 a.m.- 9:00 a.m.	History <i>By: Hugh B. Miller, Ph.D.</i>
9:00 a.m.-9:40 a.m.	Equipment <i>By: David A. Summers, Ph.D.</i>
9:40 a.m.-9:50 a.m.	Break
9:50 a.m.-10:40 a.m.	Applications <i>By: Bill Shires</i>
10:40 a.m.-11:30 a.m.	Safety <i>By: Gary W. Toothe</i>
11:30 a.m.-12:30 p.m.	Lunch

WATERJET TECHNOLOGY – BEYOND THE BASICS

12:30 p.m.-2:30 p.m.	Concurrent Sessions <ul style="list-style-type: none">- Cleaning Applications <i>By: Doug Wright</i>- Cutting Applications <i>By: Vanessa Cutler, Ph.D.</i> <i>Mohamed Hashish, Ph.D.</i>- Hydro-Excavation <i>By: Neil McLean</i>- Surface Prep Applications <i>By: Lydia M. Frenzel, Ph.D.</i>
2:30 p.m.-2:50 p.m.	Break
2:50 p.m.-4:30 p.m.	“Ask the Experts” Panel <i>Vanessa Cutler, Ph.D.</i> <i>Lydia M. Frenzel, Ph.D.</i> <i>Mohamed Hashish, Ph.D.</i> <i>Neil McLean</i> <i>Doug Wright</i>

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Could Ownership Or Use Of A Waterjet Affect The Future Of Your Business In 2009?, from pg. 19

heads and more all on one Z carriage, it is advisable to understand and request the finite element analysis of the structure of the system. Every reputable waterjet manufacturer will have this information available showing how additional loads, static and dynamic affect the overall structure, as well as the accuracy of the unit. All this theoretical data should again be verified with full 3D laser tracker, 2D laser interferometer and ball bar results. The ultimate test is, of course, the finished part, but good metrology equipment, which should be owned by a reputable waterjet manufacturer, will verify the dynamics of the machine to a far greater degree of accuracy than any finished part would show.

Imagine if just as some milling machines have tool changers allowing one machine to perform all sorts of procedures on the same part, if a waterjet could do the same! Waterjets that offer drilling, tapping, countersinks, tool changers, marking, drying, coating, finishing, automatic feed back to remote control stations all in 2D or 3D are already being used in the most imaginative ways. And if this seems interesting, go to the next step of using these capabilities with multiple heads simultaneously all on one cross beam.

“As we look back into 2008 and further, it is clear that when labor costs are lower elsewhere, it is very difficult to compete in the long term.”

As we look back into 2008 and further, it is clear that when labor costs are lower elsewhere it is very difficult to compete in the long term. No matter what the item is, if there is enough lead time to have the product produced elsewhere, it is tough to compete with low wages that will never be achievable in the USA.



(continued on page 21)

Could Ownership Or Use Of A Waterjet Affect The Future Of Your Business In 2009?, from pg. 20

What manufacturers in the USA have on our side is innovation, time and automation. We have to become the best at what we do, with the shortest lead time. We have to innovate and reduce our labor costs such that lower external labor is not a major factor in the final cost of the product. As soon as automation becomes a factor, it appears that no matter what the cost of labor, if removed from the picture, it will be very difficult for end users to risk outsourcing their manufacturing with all the complications and uncertainties that abound.

Clearly, if it is possible to source a product locally, at competitive pricing, with guaranteed consistency backed by accountability, the work should never go abroad. It is up to manufacturers to seek out and provide ways to achieve this goal. And yes, a waterjet system that offers more than just a waterjet when it comes to capability could be just the manufacturing advantage that could make a difference.

One final aspect of growing into the future is remote access of production from your living room, or your lunch meeting. Even if you are not thinking of running your equipment remotely, from your cell phone or no matter where you are, do not discount that others are. You may wake up next week and discover that your competition is producing several times the output you are, with no more than two or three employees. Remote access to the point that parts be programmed and cut remotely, motors tuned, machines squared, failed drives compensated for, is happening today and yesterday.

WARDJet is so confident in its ability to service its machines on site and remotely the company offers

a 2 year limited warranty with a Guaranteed Uptime™ program where they will pay the owner of the machine \$100 per hour or \$800 per day if the machine cannot be in production when certain criteria are met. It is this kind of innovation that is making the difference. Thinking outside the box, while putting the future of expansion and opportunity for each machine owner to grow and plan and automate their operation is a reality. 2009 is a time to ensure that every turn improves efficiency not by a small percentage, but by 100%, again and again.

Let's take the challenge with both hands to grow and innovate and create.

America did not become the great nation it is by mistake or accident. Manufacturing has a future in the USA. Let's get creative and be the driving force to make this happen.

“A waterjet system that offers more than just a waterjet when it comes to capability could be just the manufacturing advantage that could make the difference.”

WARDJet Inc. is based in Tallmadge Ohio. For more information, visit www.wardjet.com, call 330-677-9100, or email sales@wardjet.com.

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Fundamental Aspects In Waterjet Cleaning, from page 11

The last section of the article addressed the topic of process optimization, assuming metal as the substrate material. Metals can be damaged by the jet after an incubation period because of the "Wöhler behaviour." Achieving the highest productivity without causing damage to the substrate can be achieved by optimizing these three variables: (1) operating at a pressure which can cause significant mass-loss for the layer to be removed but below the incubation pressure of the substrate; (2) loading time should be below the incubation period of the substrate; (3) a proper operating distance between the nozzle and the target should be either just above or just below the peak erosion zone.

* Louis, H. & Schikorr, W. (1982) Fundamental aspects in cleaning with high-speed water jets, Proceedings of the 6th International Symposium on Jet Cutting Technology, Guildford, England, April 6-8, 1982, pp. 217-228.

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Terydon Inc. Develops New Option For User Safety

Terydon Inc. continues to emphasize safety detail in its wide selection of system and tooling developments. The world-renowned JackTrack has been established as a reliable and efficient system in the cutting industry. For safety purposes, Terydon has designed a nonmagnetic vacuum application to increase user security for task management where magnetic systems are not applicable. Previously viewed as hazardous, Terydon has modified the standard vacuum system, presenting a safety-worthy modular system option on the market.

JackTrackVacuum attaches to a variety of surfaces via 9 pairs of vacpods, producing 18 points of

holding power at 120 times the potential of each. The opposing parallel footprint of each pod creates stability for precision cuts and safety by means of individual mini vac generators per pair of pods. Other manufacturers promote a track with cups fueled by a single generator and require stabilizers to prevent rocking side to side. The individual vacuum of each pod of the JackTrackVacuum compensates for a potential loss of suction of one pod without failure of the entire track. In effect, if one pod fails at one location, the other pods maintain their vacuum, and thus their surface hold.

Only the attachments differ between the two tracks. Both

remain independent of special set-up techniques, and model flexible, yet semi-rigid composite and a carriage modular design that allows for a characteristic smooth precision cut. Complete the system with a mini radius cutter and effectively manage smaller radii in door sheets, smaller entries, and lifting holes. Both the magnetic and vacuum JackTracks present as superior cutting tracks in the industry. Tailored to specific needs on the job, these cutting systems operate with a complementing combination of safety and efficiency.

For more information, visit www.terrydon.com or call (330) 879-2448.



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Preliminary Schedule of Events

(as of 5/1/09)

MONDAY, AUGUST 17, 2009

12:00 Noon Board of Directors Meeting

6:30 p.m. Board Dinner

TUESDAY, AUGUST 18, 2009

8:00 a.m. Pre Conference Seminars

- Basics & Beyond
- Vacuum Equipment Safety Seminar

5:30 p.m.-7:00 p.m. Welcome Reception – Exhibit Hall A

WEDNESDAY, AUGUST 19, 2009

8:00 a.m.-10:00 a.m. Live Demonstrations

10:00 a.m.-4:30 p.m. Boot Camp

10:00 a.m.-5:00 p.m. Exhibits – Hall A

10:00 a.m.-7:00 p.m. Exhibits – Hall B

1:00 p.m.-5:00 p.m. Paper Presentations

5:30 p.m.-6:00 p.m. Awards Presentation – Rose Garden

6:00 p.m.-7:00 p.m. Cocktail Reception – Exhibit Hall B

THURSDAY, AUGUST 20, 2009

8:00 a.m.-10:00 a.m. Live Demonstrations

10:00 a.m. General Membership Meeting

10:00 a.m.-1:30 p.m. Exhibits – Halls A & B

10:00 a.m.-1:30 p.m. Boot Camp

1:00 p.m.-5:00 p.m. Paper Presentations

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The 60120 employs a bridge style Y-Axis design that allows the cutting head to move past the catcher tank for unobstructed loading of materials. Like all OMAX JetMachining Centers, the 60120 has the ability to cut a wide variety of materials, including ceramics, composites, plastic, glass and stone, as well as metals like aluminum, tool steel, stainless steel, mild steel and titanium with an accuracy of motion up to +/- .003 in. Like other machines in the OMAX lineup, the 60120 does not require tool changes or complex fixturing, reducing setup times by at least 50%. Its fast cutting speed, combined with minimal set up times, maximizes a user's flexibility and productivity.

The 60120 comes standard with OMAX Corporation's patented "Compute First – Move Later" motion control technology, which incorporates Windows® XP software. The system can calculate the velocity of a tool path at over 2,000 points per inch, allowing for complete control over the

motion of an abrasivejet, and enabling precise, rapid machining. Standard features include a MAXJET® 5 Diamond Nozzle Assembly, motorized Z-Axis, ultra-high pressure direct

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Correction:

OMAX® Corporation offers a Rotary Axis accessory, not a Rotary Axis Nozzle as stated in the May 2009 issue article headlined, "OMAX Introduces MAXJET 5i, Rotary Axis Nozzle."

WJTA Welcomes New Members

Corporate

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