

Live Demonstrations at the WJTA-IMCA Conference and Expo, September 9-11, 2013



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30th Anniversary WJTA-IMCA Conference/Expo A Success

The WaterJet Technology Association-Industrial & Municipal Cleaning Association (WJTA-IMCA) welcomed over 900 attendees representing 30 countries to the 2013 WJTA-IMCA Conference and Expo held September 9-11, 2013, at the George R. Brown Convention Center in Houston, Texas. The Conference/Expo is a unique event worldwide, and attendees travelled quite a distance to participate.

Fifty-seven exhibiting companies displayed waterjet supplies, equipment, systems and services and industrial vacuum trucks and hydroexcavators.

The pre-Conference workshop, *Waterjet Technology: Basics and Beyond*, was held on Monday, September 9. The course included presentations on waterjet fundamentals, applications, equipment, UHP and abrasive cutting applications, safety and a new session on robotic applications.

The educational Boot Camp sessions were well-received, with topics ranging from hydroexcavation and hands-free hydroblasting to vacuuming emissions-free and refractory removal.

Live demonstrations included surface preparation, industrial vacuuming, robotically controlled waterjet systems, the effectiveness of safety equipment and high pressure cleaning with hot water.

Some of the world's leading engineers and researchers shared the latest technological developments during paper presentations. Topics covered abrasive jet applications, medical applications, material removal and the environment, jet forces and cut surfaces, drilling and mining, efficiency enhancement and cleaning and blasting.

The WJTA-IMCA awards presentation was held on Tuesday evening, September 10. **Kenneth C. Carroll**, Birenbaum & Associates, received the Pioneer Award in recognition of his significant contributions to the advancement and development of the WJTA-IMCA.

WOMA Corporation, Kärcher Group, received the Safety Award in recognition of the development of remotely controlled waterjetting equipment and of bringing robotic waterjet cleaning equipment to a wider market.

David Zaremba, Institut für Werkstoffkunde (Materials Science), Leibniz Universität, Hannover, Germany, received the Best Paper Award for *"Robot-Assisted Displacement Osteotomy by the Abrasive Waterjet - Concept and Technical Realization."* Congratulations to Mr. Zaremba and co-authors, Fr.-W. Bach and T. Hassel, also of the Institut für Werkstoffkunde; R. Westphal and F.M. Wahl, Institute for Robotics and Process Control, Technische Universität, Braunschweig, Germany; and E. Suero and C. Krettek, Trauma Department, Hannover Medical School, Germany.

A highlight of this year's Conference/Expo was the increased representation and involvement from the end users – the plants and customers of waterjet/industrial cleaning services. A major goal of WJTA-IMCA is to bring together manufacturers, contractors and end users for the betterment of the industry.

Another highlight was the focus on new technologies

and robotic waterjetting applications. Several vendor displays and demonstrations were geared toward "hands-free" robotic applications.



With more plants and refineries nationwide requiring hands-free hydroblasting solutions, the WJTA-IMCA Expo serves an important need in showcasing these technologies and helping to educate the industry.

Thanks to the sponsors, exhibitors, and attendees. The 2013 Conference and Expo was a great success, with increased participation at all levels.

See related Conference/Expo news and photographs throughout this issue.

Next Stop...NEW ORLEANS

After over a decade in Houston, the Expo is moving to a new location – the Ernest N. Morial Convention Center in New Orleans, LA, October 12-15, 2014. New Orleans will provide exciting options for entertaining and networking and will raise the profile of the show internationally and around the United States. New Orleans provides an exciting, world-class destination while remaining in close proximity to the gulf coast industrial base.



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Waterjet Treatment at Sartell, MN, Clinic Offers Chance to Wash Away that Disc Pain

By Frank Lee, *St. Cloud Times*, St. Cloud, MN

What if you could “wash away” back and leg pain using a “blade” that never gets dull?

A powerful waterjet cutting device can be used for minimally invasive treatment of herniated discs, and Dr. Thomas Kowalkowski is the only physician in Central Minnesota to offer the procedure.

“It’s basically a high-velocity waterjet eroding system,” Kevin Staid says about the medical device that his North Billerica, MA-based company makes. “And this is our first entry into the area.”

With HydroCision, a jet of saline solution comes out of a nozzle that is 0.005 inches in diameter — “slightly larger than a hair” — and can cut away (without an actual blade) protruding disc tissue that can cause back and leg pain.

“Just the energy of the jet would be doing the cutting,” says Staid, an engineer. “In our case, the water is going about 600 miles an hour and has the ability to cut quite effectively.”

The advantages of the 20-minute outpatient procedure are: no hospitalization, quicker recovery times, less pain, no surgical trauma to the back muscles and no general anesthesia.

“There is no muscle damage, no bone removal, no nerve root manipulation ... and the size of the wound is approximately 4 mm,” Kowalkowski says.

Kowalkowski began offering HydroCision a few years ago to

his patients; he is the medical director of the Interventional Pain and Physical Medicine Clinic in Sartell.

“The procedure and the study I have completed on it was published in a pain journal this summer,” he says of the official publication of the International Association for the Study of Pain.

HydroCision

Water-based tools previously have been used outside the medical field. “They were used in the aerospace industry and automotive industry for cutting and preparing things ... because the blade never gets dull or gunky,” Staid says.

HydroCision Inc. brought its cutting device into the medical field in 2005, and disc treatment is one of the uses.

When the outer wall of a spinal disc becomes damaged or weakened through age or injury, the inner part of the disc may bulge out in what is known as “disc herniation” or a “slipped” disc.

The waterjet comes out of a tiny tube at the end of a spark plug-like tip and is collected — along with the blasted tissue — in another tube built into the same probe, completing a circuit of sorts.

“When the physician’s foot is not on the control pedal, it’s nothing but a benign metal probe,” says Staid, who came up with the concept with Tim Moutafis, a colleague.



Dr. Thomas Kowalkowski, medical director of the Interventional Pain and Physical Medicine Clinic in Sartell, MN, shows a new device called HydroCision on Sept. 17, 2013. The device is a treatment that removes herniated disc tissue without surgery. Photo by Jason Wachter, *St. Cloud Times*.

Staid is the chief technology officer and vice president of application development at HydroCision Inc., a developer and manufacturer of fluidjet-based surgical tools.

“He (Moutafis) came upon the idea of using high-velocity waterjets as a tool, which had been used extensively in industry but had not been developed for use in medicine at all,” Staid says.

Kowalkowski says, “I really became intrigued with the technology, to a point that we’ve performed probably over 50 procedures, and many of those patients have been offered surgery as an option for their disc herniation.”

Spinal Discs

Only spinal discs that have not ruptured may be treated with the water-based procedure, according to Kowalkowski.

(continued on page 19)

Flow International to be Acquired by American Industrial Partners

Flow International Corporation has entered into a definitive agreement to be acquired by American Industrial Partners (AIP), a middle-market private equity firm focused on North American-headquartered industrial businesses, in a transaction valued in excess of \$200 million.

Under the terms of the merger agreement, AIP will acquire all of the outstanding shares of Flow common stock for \$4.05 per share in cash. This value represents an 11.3 times multiple of trailing four quarter reported EBITDA, which was \$17.8 million as of July 31, 2013. The Flow Board of Directors has unanimously approved the merger agreement.

Charley Brown, president and CEO of Flow says, "I am pleased to announce this agreement, which maximizes value for all of our shareholders. This transaction represents a successful conclusion to our extensive 'strategic alternatives' investigation, during which the Company contacted many strategic and financial partners. In AIP, we have a partner with a strong reputation and proven record of success, who understands the potential of Flow's waterjet solutions and has the resources and expertise to help accelerate our growth plans. We believe this transaction appropriately recognizes the value of Flow's technology and customer relationships, while providing our stockholders with a meaningful cash premium for their investment."

Mr. Brown adds, "Flow's success is driven by our talented employees, and, on behalf of the Board and management team, I thank them for their tireless efforts to make Flow the strong company it is today. AIP shares our confidence in Flow's future and

will support us as we continue to work toward our long-term goals."

Richard Hoffman, partner of AIP says, "We are excited about this agreement with Flow, which is known throughout its industry for its innovative waterjet technology. We have been impressed by the Company's capabilities and its strong relationships with its global customer base. We will work with the Flow management team to continue investing in the Company's technology to grow the waterjet share of the worldwide cutting market."

The transaction is expected to close in early 2014 and is subject to the approval of Flow's shareholders, regulatory approvals, and other customary closing conditions. The transaction has fully committed financing and is not subject to any condition with regard to the financing.

UBS Investment Bank is serving as Flow's financial advisor and K&L Gates LLP is serving as legal counsel. Houlihan Lokey is serving as AIP's financial advisor and Ropes & Gray and Baker Botts are serving as co-legal counsel.

Reserve Your Copies of the New, Updated Waterjetting and Industrial Vacuum Recommended Practices

During the past year, the Safety Committee for High Pressure and Safety Committee for Vacuum Equipment have spent many hours updating the **Recommended Practices for High Pressure Waterjetting Equipment and Industrial Vacuum Equipment**. The new editions will be available on November 15, 2013.

A summary of the major updates to each publication appears below:

Recommended Practices for the Use of High Pressure Waterjetting Equipment, 5th Edition

- New Section Covering Design Criteria
- Establishment of a Hydroblasting Zone Around the Work Area and Pump

- Expanded Recommendations on Hose Inspections and Testing
- In-depth Treatment of Hose Safety Shrouds

Recommended Practices for the Use of Industrial Vacuum Equipment, 2nd Edition

- Expanded Section Covering Hydroexcavation
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Jack Doheny Companies, Inc. Completes Merger with Jet-Vac, Inc.

Jack Doheny Companies (JDC) has announced the completion of its merger with longtime business affiliate Jet-Vac, Inc. in Wharton, NJ, as of June 30, 2013. JDC has sold sewer cleaning, DOT-certified vacuum trucks, pipeline inspection and other related equipment for more than three decades.



This merger provides financial and managerial support, which allows the company to be more responsive to customers in the Northeast. "The wastewater industry is often an emergency-driven field, making the success of those involved subject to the immediate availability of the vehicles and equipment they need to get the job done now," says CEO and company namesake, Jack Doheny.

"The Northeast is an intensely busy market, so we have hit the ground running," says JDC President Dan Weber. "We have added resources in the region to meet the growing market demand. Our employees personify the core values of our company—only the best quality product, service and support. We have tapped some of our best people to expand our presence in this region, at a level the industry has come to expect of Jack Doheny Companies."

JDC will use the Wharton location to provide equipment sales and rental support. The company is also finalizing the purchase of another location on Long Island, to better support its municipal and commercial contractor base there, as well. "Just to get across the metropolitan area in traffic can be a half-day job," asserts Doheny.

"These service centers will allow us to provide truly responsive service to our customers in any part of the region. It's all about having great customer service, the best mechanics you can get, and the right equipment ready to go."

The vehicles and equipment at the Wharton facility are representa-

tive of the company's expansive, top-of-the-line rental fleet. "Specifically, on the municipal side, we will continue to represent Vactor Manufacturing and their combination sewer cleaning units," says Weber. "We'll also carry Stetco catch basin units, Sewer Equipment Company of America jetter units, and other equipment related to servicing the underground water, sewer and drainage infrastructure." The company will also offer products from IBAK, a world technological leader in closed-circuit TV systems, for televising and inspecting pipe in those applications.

The company also sells, services and rents other manufacturers' equipment, such as DOT-certified vacuum trucks from Cusco, Keith Huber and Custom Vac, which support the municipal, utility, petrochemical, and gas and oil exploration markets.

"We all know the tremendous pressure that cities are under to stretch their dollars. Many municipalities and contractors can no longer afford to own some of these expensive machines, simply to have on standby," says Doheny. "In more and more cases, customers are using our rental fleet to manage fluctuating demand and emergency situations. We're here to provide our customers with rentals as needed, to consult with them on purchases within their budgets and to service their equipment."

Management has also evolved with the merger. Ty Rose has been named the new general manager of the Wharton facility. His extensive experience in the industry, including equipment and applications, along with his tenure at the company headquarters makes him uniquely qualified to take on this important role.

Under Rose's direction, his team will service customers at the ten-acre, 15,000-square-foot, eight-bay service facility at the Wharton location, where it will also offer full equipment rebuilds. Rose is deservedly proud of the first-class facilities and the highly trained mechanics working there. "We service our equipment, we service competitive equipment," Rose says. "We have the skills, the space and the tools to work on anything."

Across its nationwide network of sales and service facilities, JDC carries more than \$10 million in parts inventory, to provide immediate response for customer repairs or enhancements. The company also maintains a fleet of mobile service trucks manned by highly trained technicians, who can be dispatched to service equipment at customers' sites.

(continued on page 18)

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WJTA-IMCA Announces Officers, Board of Directors

Bill Gaff, vice president of sales and marketing for Vacuum Truck Rentals, LLC, and Vacuum Truck Sales and Service, both headquartered in Richland, MS, has been elected the 2013-2015 chairman of the board of the WaterJet Technology Association (WJTA) – Industrial & Municipal Cleaning Association (IMCA). Also elected for the 2013-2015 term are President **George A. Savanick, Ph.D.**, consultant, Apple Valley, MN; Vice President **Bill McClister**, vice president of equipment and technology, Veolia ES Industrial Services, Inc., Baytown, TX; Secretary **Kathy Krupp**, maintenance process leader, The Dow Chemical Company, Freeport, TX; and Treasurer **Larry Loper**, president and director of sales, High Pressure Equipment Company, Erie, PA.

New elected board members are **Fred D. Clark**, chief executive officer and corporate secretary for IVS Hydro, Inc., Institute, WV; **Kay Doheny**, owner of Jack Doheny Supplies, Inc., Northville, MI; **Mohamed Hashish, Ph.D.**, senior vice president of technology, Flow International Corporation, Kent, WA; and **Gary Noto**, chief executive officer, Aquilex HydroChem, Deer Park, TX.

Luis Garcia, Channel Safety & Marine Supply, A Northern Safety Company, La Porte, TX; **Kerry Siggins**, chief executive officer, StoneAge, Inc., Durango, CO, and **Forrest Shook**, president, NLB Corp., Wixom, MI, continue to serve remaining terms on the board.

For more information, contact the WJTA-IMCA.

OMAX[®] Corporation Awarded Prestigious *Inc. Magazine* Honor

OMAX Corporation has once again made *Inc. magazine's* 500|5000 list of fastest-growing private companies in America. The magazine develops this list annually to recognize and celebrate the success of growing companies, and this is OMAX's third appearance on the esteemed list.

OMAX ranks 134th as the fastest-growing, privately held company in the manufacturing industry and 3,211th overall on this year's list, having experienced 101 percent business growth between 2009 and 2012. The company attributes much of its growth to the increased demand for its products and services around the world. To date, the company is present in more than 50 countries through OMAX team members and distribution partners.

To accommodate its growth, OMAX recently expanded its headquarters and manufacturing campus in Kent, WA, by adding a new 22,000-square-foot training, research and development center. The company is also making significant investments in its research and development department to be able to explore the frontier of new abrasive waterjet technology, including micromachining, as well as to continuously develop high quality, versatile solutions that further reduce production costs and simplify part processing.

"It is a testament to our team's effort and dedication to be recognized with this prestigious honor for a third time," says Dr. John Cheung, CEO of OMAX Corporation. "Our company's growth and the increased demand for our products come from the fact that manufacturers across all industry segments better understand abrasive

waterjet technology and how it can optimize their operations. Abrasive waterjet machining is finally becoming less of an alternative solution and more of a conventional choice."

The timing of this *Inc. magazine* honor corresponds with the company's 20th year in business. On August 20, OMAX held a special anniversary event at its headquarters to celebrate two decades of continuous innovation in abrasive waterjet technology. Dr. John Cheung and Dr. John Olsen founded OMAX in 1993, having found a way to revolutionize the abrasive waterjet machining process. A new type of motion control technology and proprietary software allowed for the development of the first truly affordable abrasive waterjet system to offer fast, precise and consistent results. Today, OMAX Corporation continues to shape the future of abrasive waterjet machining with its diverse, highly advanced product solutions that offer the broadest range of table sizes, pumps, accessories and software on the market.

The 2013 *Inc. 500|5000* list is ranked according to percentage revenue growth when comparing 2009 to 2012. To qualify, companies must have been founded and generating revenue by March 31, 2009. They had to be U.S.-based, privately held, for profit and independent—not subsidiaries or divisions of other companies—as of December 31, 2012. They must also have required minimum revenues of \$100,000 for 2009 and \$2 million for 2012.

For a complete listing of the *Inc. 5000*, including company profiles and an interactive database that can be sorted by industry, region, and other criteria, visit: www.inc.com/5000.

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Worker Loses Leg in Waterjet Accident in the United Kingdom

By: Grant Prior, News Editor, Construction Enquirer

A hydrodemolition specialist has been sentenced for serious safety failings after two incidents in less than a week left two employees with life-changing disabling injuries. Dundee Sheriff Court heard that Hampshire based Hydro Pumps Ltd. had been subcontracted to cut away concrete top sections of the support columns on the Tay Road Bridge to allow engineers to replace worn out support bearings.

On 26 July 2007 a 27-year-old employee was using a hand-held jet gun that delivered a high-pressure concentrated stream of water.

He suddenly slipped and fell, losing his grip on the gun.

He toppled forward as he had been balancing himself against the force generated by the gun, and the waterjet penetrated into his abdomen.

Due to his severe injuries he has been unable to return to work since.

The work was suspended pending an internal investigation.

But, within ten minutes of it resuming on August 1, a second employee, who had been brought in to replace the first, was himself seriously injured when the same gun came apart in his hands and he lost control of it, resulting in the waterjet shooting into his knee.

He was taken to the hospital with severe leg injuries. Despite two operations to try and save his leg, it needed to be amputated.

Hydro Pumps Ltd. of Fareham, Hampshire, pleaded guilty to safety breaches and was fined £46,500.

Following the case, HSE Inspector Gerry McCulloch, said: "These tragic and almost identical incidents could easily have been avoided had Hydro Pumps Ltd. identified the risks associated with this kind of work and implemented appropriate risk-reduction measures.

"The first incident should have been a clear wake-up call that the waterjetting was unsafe but little changed and

it was only ten minutes after Hydro Pumps Ltd. had restarted the job that the second man was injured.

"Two workers suffered severe and life-changing injuries, the effects of which are still felt today and will be for the foreseeable future."

Article reprinted by permission from the online news source, Construction Enquirer, September 30, 2013. For more information, visit www.constructionenquirer.com.

WJTA-IMCA Unveils New Logo



WJTA-IMCA has announced an update to the association logo. The new logo combines the WaterJet Technology Association and Industrial & Municipal Cleaning Association logos into one design.

"The updated logo maintains continuity with the current association logo and the 30-year history of WJTA, while representing the diverse industry sectors served by WJTA and IMCA," says President George

A. Savanick, Ph.D. "WJTA-IMCA is an inclusive organization for anyone with an interest in waterjetting or industrial cleaning technology and we want our logo to reflect that."

The logo was updated by the Communications Committee as a part of the forthcoming redesigned WJTA-IMCA website. The new website will provide easier access to the resources of WJTA-IMCA for members and non-members alike.

IMPORTANT NOTICE REGARDING SPAM

Email addresses and other member contact information published in the WJTA-IMCA Membership Directory are meant to encourage helpful, informative communication between members. The information is not provided to circulate spam or junk mail.

The WJTA-IMCA leadership requests that members respect the contact information of fellow members and not use that information for the dissemination of spam or junk email. Membership information is not meant to be circulated beyond the WJTA-IMCA membership.

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Boot Camp Session at the 2013 WJTA-IMCA Conference and Expo.

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Notice of Dues Increase

At the September 10, 2012, meeting of the WJTA-IMCA Board of Directors, an increase in membership dues was approved. Since the formation of the WJTA over thirty years ago there have been only two dues increases (1992 and 2001) for all members.*

At the founding of the WJTA in 1983, corporate dues were \$250 and individual dues were \$40. Updating for inflation, the 1983 \$250 corporate dues would be \$590 as of January 1, 2014, nearly equal to the \$600 corporate dues for 2014, and the \$40 Individual dues would be \$94, slightly more than the \$90 individual dues for 2014. The new dues structure is compiled in the table below.

2014 Membership Dues Structure		
	US, Canada, Mexico	International
Individual	\$90.00	\$130.00
Corporate	\$600.00	\$700.00
Corporate Individual	\$75.00	\$105.00

The Board has worked hard to avoid a dues increase over the past 13 years, especially during the economic downturn that began in 2008. However, at some point, the dues must be adjusted for inflation, and that is what we are doing now.

The additional revenue from next year’s membership dues will be reinvested into projects intended to further WJTA-IMCA’s goals of driving industry safety, best practices, new technology, new applications, and education. Projects currently underway or recently completed include:

- A user-friendly redesign of WJTA-IMCA’s website
- A new online Member Search Directory
- Updates to the Recommended Practices for the Use of High Pressure Waterjetting Equipment, including a new section on design criteria
- Updates to the Recommended Practices for the Use of Industrial Vacuum Equipment, including an expanded section covering hydroexcavation
- A new waterjet safety video in production
- Increasing educational and training offerings

WJTA-IMCA is also developing long-term plans to increase the level of awareness for high pressure waterjetting solutions in general industry and in helping to develop the next generation of waterjetting professionals.

WJTA-IMCA remains one of the best values in the industry. The additional revenue from the membership dues will allow us to continue to provide you with great value, and hopefully, to increase that value.

We rely on your support, involvement and guidance to grow and improve the WJTA-IMCA. We invite you to contact the WJTA-IMCA administrative office with any questions or concerns, or suggestions for how WJTA-IMCA can best serve you and the industry.

George A. Savanick, Ph.D.
 President

Bill Gaff
 Chairman

*There was an increase in 2012 only affecting members outside the US, Canada and Mexico to defray rising postage costs for international mail.

Jet News is published by the WaterJet Technology Association (WJTA)-Industrial & Municipal Cleaning Association (IMCA) and is a benefit of membership in the Association.

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Aqua Cutter Robot Reduces Costs on Singapore MRT Contract

The use of Aquajet's hydrodemolition technology has dramatically reduced labor costs on the construction of part of Singapore's new Downtown Line, eliminating up to 50 jackhammer operatives.

The Austrian tunnelling contractor working on a section of Singapore's new Downtown MRT Line has been able to save on the cost of up to 50 jackhammer operators by using an Aquajet Aqua Cutter 710V hydrodemolition robot system on three of the underground stations.

The Aquajet machine is the first to have been sold in Singapore, and the Southeast Asia region, by the Swedish manufacturer's new distributor for Asia, Asia Waterjet Equipment Pte Ltd (AWE).

Alpine Bau GmbH (Singapore) was awarded two contract sections, C917 and C918, of the Downtown Line Stage 2 project by Singapore's Land Transport Authority.

The two sections involve the construction of three new metro stations and single-track metro tunnels to a length of 5.72 km constructed by tunnel boring machines, and a further 445 m by the cut-and-cover method.

The contract value for both sections is S\$670.74 million (322 million Euros).

Alpine had also previously constructed two sections of Loop Lines 3 and 4 in Singapore.

Contract section C917 included the construction of the King Albert Park and Sixth Avenue stations while contract C918 included construction of Tan Kah Kee station, which was designed for use by the civil defence in case of emergencies.

Christopher Parkhill, regional sales manager for AWE, says that the Tan Kah Kee station, owing to its civil defence status, had extra-deep piling and station walls that are formed from an inner and an outer skin.

"There are large surfaces where the concrete has to be removed and the reinforcement rods bent to connect the two walls," he says.

"The other two stations, which are more conventional in structure, also require the concrete walls to be



The 710V robot processes the floor in front of train tunnel.

smoothed and the rods to be freed up and bent back.

(continued on page 32)

Jack Doheny Companies, Inc. Completes Merger with Jet-Vac, Inc., from page 8

JDC President Weber is particularly enthusiastic about bringing JDC's aggressive and innovative training techniques to Wharton. "It's our belief that proper training is the ongoing responsibility of everyone," he contends. "We offer proven, well-established service training classes held either on-site or at customer locations. JDC intends to significantly drive the level of training we provide to all our customers in this region."

JDC has completed design proposals to double the size of the Wharton service center and triple the size of its parts department to meet the demand in the Northeast. Groundbreaking on new construction is expected sometime next spring, but JDC is not waiting for that change to improve the existing facility, both operationally

and aesthetically. Renovations and ergonomic enhancements are already underway to increase the overall productivity of the workforce. "We intend to attract the top mechanics in this industry," explains Weber, "who can look forward to coming to work in a clean, safe, world-class service center."

"The merger and related investments are in direct response to feedback from the customers in this market," says Kay Doheny, Jack's daughter and co-owner and executive vice president. "Our customers are excited and we're excited to have the opportunity to meet their immediate and future needs."

For more information, visit www.dohenycompanies.com. ■

Waterjet Treatment at Sartell, MN, Clinic Offers Chance to Wash Away that Disc Pain, from page 4

HydroCision costs about \$2,000 to perform at his Sartell clinic and may be covered by insurance — compared with the estimated \$15,000 it would cost for surgery, he says.

“There is a week’s recovery time versus, many times, eight weeks or more with surgery,” Kowalkowski says.

He also says that in the worst-case scenario that HydroCision does not work, the patient could still have surgery; HydroCision has between a 73 and 98 percent success rate.

The physician uses a fluoroscope, which is a machine that projects live X-ray images onto a monitor, to place the water-dispensing probe within the disc.

“The patient is not even fully anesthetized. They’re awake and alert on the table,” Staid says.

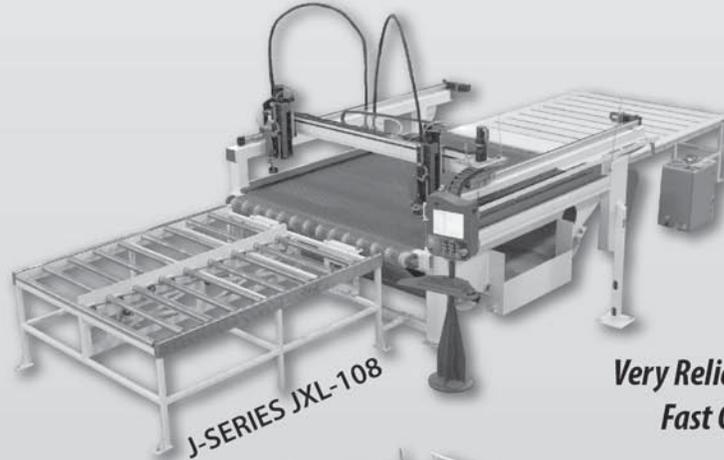
The system has been used in more than 45,000 spinal, arthroscopic and wound debridement procedures, according to HydroCision Inc.

“We’ve been able to document a physiological reduction in the size of the disc immediately after the procedure,” Kowalkowski says.

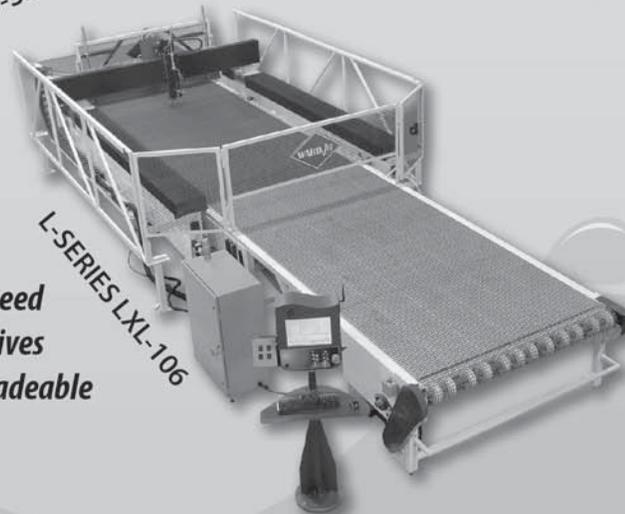
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back pain at least once during their lives, and more severe leg pain can affect one’s ability to walk, according to the Mayo Clinic.

“At the end of the day, it was hard to even walk because I just ached so bad, and I couldn’t do the activities that I used to be

able to do,” says Amy Rasmussen, a patient of Kowalkowski’s.

The 36-year-old registered nurse from Zimmerman, MN, says based on her work in a health care setting, she

(continued on page 36)

Exhibitors at the 2013 WJTA-IMCA Conference and Expo, from page 16



24 Hr Safety
 Advanced Pressure Systems
 BIC Alliance
 Blasters, Inc.
 CSM Supply, A Northern Safety Company
 Carolina Equipment & Supply (CESCO)
 Chemac, Inc.
 Cleaner Times/IWA
 Coastal Resource Group
 D&S Professional Services
 DeBusk Services Group LLC
 Diesse Rubber Hoses S.p.A.
 Dragon Products, Ltd.
 DrumBEAT Marketing
 FS Solutions
 Fruitland Manufacturing
 GHX Industrial, LLC
 GapVax, Inc.
 Gardner Denver Water Jetting Systems, Inc.
 General Pump
 Giant Industries, Inc.

Global Vacuum Systems, Inc.
 Guzzler Manufacturing
 Hammelmann Corp.
 Heintzmann Corporation
 High Pressure Equipment Co.
 HoldTight Solutions Inc.
 Idrojet, s.r.l.
 JGB Enterprises, Inc.
 Jack Doherty Companies, Inc.
 Jetstream of Houston, LLP
 LaPlace Equipment Co., Inc.
 Ledwell & Son Enterprises, Inc.
 Maxpro Technologies, Inc.
 NLB Corp.
 Newson Gale, Inc.
 Parker Hannifin-EPD
 Peinemann Equipment B.V.
 Powertrack International Inc.
 Presvac Systems
 Ramvac Vacuum Excavators

Reliable Pump Consultants, Inc.
 Safety Lamp of Houston, Inc.
 Sewer Equipment Company of America
 SPIR STAR
 Stewart R. Browne Manufacturing Co. Inc.
 StoneAge, Inc.
 Stutes Enterprise Systems, Inc.
 Terydon, Inc.
 The Blast Bag Company, Inc.
 Trillium Industrial Services
 TurtleSkin WaterArmor by Warwick Mills
 US Jetting, Inc.
 Under Pressure Systems, Inc.
 United States Environmental Services
 Vac-Con, Inc.
 Vactor Manufacturing
 Vacuum Truck Rentals, LLC
 Veolia Environmental Services
 Wilco Supply L.P.
 WOMA/Kärcher Group

CRC Mining to Revolutionize Cable-Bolt Drilling in Underground Mining

CRC Mining is developing a revolutionary waterjet drilling tool capable of rapidly drilling 8m+ holes to cable-bolt hole requirements, which will significantly improve productivity and reduce manual handling associated with the existing cable bolt drilling methods.

Current cable-bolt or long tendon installation practice for underground roof support is considered to be a highly unproductive exercise, and presents a major bottleneck to roadway development in underground coal mining. "The required manual handling of drill rods during the drilling process presents a hazard to cable bolting operators, as well as exposing them to unsupported rock mass," states Scott Adam, CRC Mining's Underground Coal Program Leader. "An urgent need exists for an improved technique for mounted cable bolt drilling and installation systems, to increase both safety and productivity."

A recently concluded investigative project funded by CRC Mining and ACARP has investigated the potential of CRC Mining's waterjet technology in drilling holes for cable bolts in underground coal mines. Using a variety of drilling apparatus to assess the functional requirements for cable bolt drilling, the investigation has successfully demonstrated that good quality holes (tight diameter control, straight trajectory) for cable bolt installation can be drilled in sandstone at appropriate drilling speeds.

"The waterjet drilling technology deploys a high-pressure waterjet cutting head attached at the end of a high-pressure hose for rapid and continuous drilling of holes of varying length, without the need for manual adding or



removing of drill rods as part of the cable bolt installation process," Mr. Adam says.

According to Mr. Adam, applying the technology in underground mining will increase productivity of the cable-bolt installation process, and eliminate manual drill rod handling, which will lead to a reduction in operator risks. "The technology will also provide step improvements in Underground Roadway Development productivity," he says. "In addition, there is strong potential for combining the waterjet technology with cable-bolt installation and eventually automating the entire installation process."

A subsequent development program is currently being proposed to engineer the capabilities demonstrated during the investigative project into a single prototype tool and deployment system.

This system will then be deployed into a mining environment for proof-of-concept demonstration and assessment trials to examine long-hole deviation and handling of actual strata conditions and variation.

A roadmap to take this project to technology transfer has been developed. With a membership including major mining houses and OEM's, CRC Mining is well positioned to explore opportunities for technology transfer at the appropriate point of the technology's maturity.

Article and photographs printed courtesy of CRC Mining, Pinjara Hills, Queensland, Australia. For more information, visit www.crcmining.com.au or contact Scott Adam, Program Leader, Underground Coal Mining, s.adam@crcmining.com.au.

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DERC Salotech Introduces New Standards for Cleaning Reactor Vessels During Process

DERC Salotech has developed a new system for cleaning reactor vessels with the StoneAge Torus TR 130 high pressure waterjets. The system is completely integrated in the production process of the (petro) chemical production plant.

The system consists of:

- an innovative PLC-controlled tank cleaning positioning device, mounted on the reactor vessel, with new StoneAge Torus TR 130
- a high pressure waterjetting pump
- a touch control and operating panel in the control room

Description

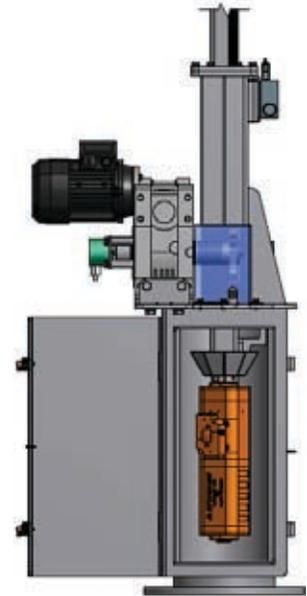
The tank cleaning positioning device is mounted on top of the reactor vessel and is separated from the reactor with

a sliding valve. For starting the cleaning process the valve is opened and the operator starts up the cleaning program by pressing the start button.

Control and adjustments of the time and position of the tank cleaning head in the reactor can be monitored and changed from the touch screen in the control room of the factory. The positioning device runs the complete program and after finishing the cleaning cycle in the last position it returns to the start position.



Cleaning System on Plant



Cleaning System Reactor Vessel

(continued on page 40)

2013-2015 WJTA-IMCA Committees

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John Wolgamott
Ken Carroll

Paper Awards Committee

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George Savanick, Ph.D.
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Material Handling Equipment Manufacturer Anderson-Crane Company Installs Jet Edge Waterjet to Increase Productivity, Improve Quality

Anderson-Crane Company, a material handling equipment manufacturer, has installed a Jet Edge waterjet cutting system at its fabrication facility in Litchfield, MN. With its new waterjet system, Anderson-Crane is now capable of cutting complex finished-quality parts from virtually any material.

Anderson-Crane Company manufactures a wide variety of material handling equipment, including screw conveyors, screw feeders and bucket elevators, specializing in custom projects. Anderson-Crane conveyors are used around the world to move everything from chocolate to taconite. The company also fabricates hoppers, bins and gates. In addition to manufacturing its own products, Anderson-Crane operates as a local job shop, building structural equipment for local businesses and molds for the plastics industry. It also offers metal repair services.

Founded in 1950 as an offshoot of its Minneapolis-based sister company Anderson-Crane Rubber Company, Anderson-Crane Company has been steadily growing its fabrication facility and capabilities for more than 60 years.

Company spokesman Rob Crane attributes his company's growth and customer loyalty to its unsurpassed commitment to quality and its expertise in manufacturing custom material handling equipment.

"Anderson-Crane has become recognized as a leader in quality in the material handling business, delivering products with a very high attention to detail and finish," Crane comments. "We have decades-long customers that include Fortune 500 companies and major multi-nationals. We pay very close attention to our products' fit and

finish, assuring all dimensions are precise and weldments are cleaned. Customers call on us when they have a special conveyor design that can't be found in a catalog. We treat our customers' projects as unique equipment that deserves close attention to detail and quality."

This meticulous attention to quality is what compelled Anderson-Crane to install a precision waterjet cutting system, Crane notes. Before installing its waterjet, the company had been cutting parts on a CNC plasma machine and outsourcing work to waterjet shops.

"Due to our high demand for quality, we have spent a lot of time cleaning parts that come off our plasma machine," Crane recalls. "We decided to buy a waterjet because of its clean cut; our goal is to reduce rework and part cleaning time. We wanted a system that cut parts with little or no edge cleanup required. A laser proved too costly and a waterjet allowed us to cut metal (our main working material), but also softer material such as gasket. We had been outsourcing waterjet cutting and were always satisfied with the edge quality and easy assembly of its finished parts. With the waterjet we're able to move from raw material to finished parts in as little time as possible while improving our products' quality and precision."

Anderson-Crane's new waterjet cutting capabilities will help the company maintain its competitive edge, Crane notes.



Anderson-Crane's Jet Edge Mid Rail Gantry Waterjet System. Photo courtesy Anderson-Crane Company.

"Manufacturers in the material handling industry do not focus on the same level of quality as we do," he says. "Adding a waterjet to our fabrication process set the quality bar even higher. Our goal is to minimize the time it takes to go from raw material to assembly. As we implement this, we're striving to consistently deliver a product with outstanding quality. We're setting Anderson-Crane even further apart in an industry where quality and workmanship are often afterthoughts."

In addition to improving its own products, Anderson-Crane also plans to grow its job shop business by offering waterjet cutting services. It plans to cut primarily mild and stainless steel and occasionally rubber gasket and UHMW.

Anderson-Crane's Jet Edge Mid Rail Gantry waterjet system features an 8 ft. x 13 ft. work envelope and SigmaNEST® Companion CAD/CAM nesting software to maximize material usage. It is powered by a 60,000 psi, 50 hp Jet Edge iP60-50 waterjet intensifier pump. The system features an eco-friendly Ebbco closed-loop

(continued on page 37)

Awards Ceremony at the 2013 WJTA-IMCA Conference and Expo

September 10, 2013 • Houston, Texas



Ken Carroll, WJTA-IMCA Association Manager, receives the Pioneer Award.



(l. to r.) Jochen Trautman accepts the Safety Award presented to WOMA Corporation/Kärcher Group from Dr. Hugh Miller.



(l. to r.) David Zaremba receives the Best Paper Award* from Dr. Mohamed Hashish.



Retiring Board Member: (l. to r.) Dr. Hugh Miller (recipient), and Dr. George Savanick.



Retiring Board Member: (l. to r.) Pat DeBusk (recipient), and Dr. George Savanick.

*Best Paper: "Robot-Assisted Displacement Osteotomy by the Abrasive Waterjet - Concept and Technical Realization," by D. Zaremba, R. Westphal, E. Suero, C. Krettek, F.M. Wahl, Fr.-W. Bach and T. Hassel.

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OMAX[®] Corporation's 20th Anniversary Event Draws Huge Crowd

OMAX Corporation welcomed nearly 600 customers, friends, family and special guests from across the country at Shape The Future: OMAX's 20th Anniversary Open House and Technology Event. In addition to live cutting demonstrations and interactive technical sessions, the event featured tours of OMAX's recently expanded, state-of-the-art manufacturing facility in Kent, WA.

Dr. John Cheung and Dr. John Olsen founded OMAX in 1993, having found a way to revolutionize the waterjet machining process. A new type of motion control technology and proprietary software allowed for the development of an affordable waterjet system that offers fast, precise and consistent results. Today, OMAX Corporation continues to shape the future of waterjet machining with its diverse, highly advanced product solutions that offer the broadest range of table sizes, pumps, accessories and software on the market.

Innovation took center stage at the anniversary celebration as attendees witnessed cutting-edge machining advancements throughout the facility. One such key advancement was the introduction of the new MicroMAX[™] JetMachining[®] Center, which provides manufacturers with the ability to cut parts or part features smaller than 400 microns from a wide range of thicknesses and materials, including exotic metals, advanced composites, polymer thermoplastics and glass.

Ideal for prototype development and production runs, the MicroMAX is a highly rigid machine with a table size of 2 feet 4 inches by 2 feet



(l.to r.) Carl Olsen, Software Engineering Manager; Jim O'Connor, Chief Financial Officer; Dr. John Cheung, COO, Founder; and Dr. John Olsen, CEO, Founder.

4 inches and an X-Y cutting travel of 2 feet by 2 feet. It utilizes advanced high-precision linear encoders, innovative vibration isolation and intuitive software control systems to achieve a position repeatability of ± 2.5 microns (± 0.0001 "") and a positioning accuracy of approximately ± 10 microns (± 0.0004 "").

The MicroMAX comes equipped with a high precision 7/15 Mini MAXJET5i nozzle that features a 0.007-inch orifice and 0.015-inch mixing tube combination for quickly and accurately cutting delicate, complex patterns. Because it forms a jet stream carrying an extremely fine abrasive, the nozzle can produce a kerf as small as 0.015-inch. The machine also has advanced pressure controls for piercing delicate materials.

At the event, OMAX also launched a new version of its Intelli-MAX[®] Software Suite, an intuitive control software that automatically optimizes the tool paths of the company's advanced abrasive waterjet systems. The new Intelli-MAX 20 incorporates several enhanced features that improve the speed and memory utilization of OMAX JetMachining and MAXIEM[®] JetCutting Centers as well as new tools that allow for increased operator efficiency.

Attendees experienced the 3D part cutting capabilities of the company's Rotary Axis. The Rotary Axis head provides infinite rotation while cutting, making it ideal for pipe and tube, circular and square stock materials. The company also displayed its fourth generation direct drive pump technology, designed for optimal efficiency, less energy usage, faster cutting speed per

unit of input power and lower cost per finished part as compared with other pump technologies.

OMAX's new Intelli-VISOR[®] System Monitoring Package was also on display. Through its streamlined software interface and robust machine sensor network, Intelli-VISOR oversees the status and performance of an OMAX abrasive waterjet throughout the entire cutting process. Intelli-VISOR works to increase efficiency and uptime of any OMAX JetMachining Center by connecting operation controls with machine maintenance. The system can automatically pause the machine before resources are exhausted, while allowing the user to ensure proper pressure at the pump and predict potential interruptions before starting a cut. Further adding to its high adaptability, Intelli-VISOR can alert the operator of any issues at the machine control screen, and with an Internet connection can distribute an alert notice to up to four people via email or SMS text messaging.

In addition to advanced technology, OMAX showcased its expanded manufacturing facility. The new 22,000-square-foot building added to the campus extends the company's

(continued on page 33)

Hughes' Pumping System Helps Clean Iraqi Sewers

Hughes Pumps has supplied its largest ever pump for use in a specialist sewer cleaning application in Iraq.

The powerful pumping system, supplied through Hughes' Middle East agent, Action International in Dubai, will enable the end-user specialist contractor appointed by the Iraqi authorities to clean large diameter sewers that have not been maintained for many years, and help towards restoring the country's water and wastewater infrastructure.

The Hughes' system comprises an HPS5000 pump with a performance of 775 lpm at 250 bar (205 gpm at 3,625psi) driven by a 500hp Volvo die-

sel engine, all supplied in a crashframe for mounting to a locally packaged truck in Iraq. Typically 150 hp pumps are used for sewer cleaning applications with a performance of 400 lpm at 140 bar (106 gpm at 2,000 psi) and 100 m (300 ft) of hose, highlighting the power of this unit.

Due to the long distances between sewer access points, 320 m of 38 mm diameter (1,050 ft of 1½") high pressure hose was supplied on a remotely mounted hydraulic driven hosereel. The enormous power produced unparalleled cleaning and flushing performance.

With the pump flowrate being so high the water source needed to be

(continued on page 31)



Hughes HPS5000DC pumpset and remote hosereel on test at the Hughes factory.



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WARDJet's Water-Only Waterjet System

While many people are familiar with abrasive waterjet cutting, the field of pure water-only cutting is quickly expanding. One major advantage of water-only waterjets is their ability to perform cuts without interfering with the intrinsic properties of the material. The narrow kerf of water-only cutting allows for intricate cuts and for close nesting of parts which increases product yield and reduces waste. WARDJet's J-Series water-only waterjet is versatile, powerful, and efficient for many applications and a variety of materials.

Rubber, insulation, food, cloth, and plastic are just some of the materials that are often cut very successfully with water-only waterjets. Even spongy (low durometer) material like foam is well suited for water-only cutting. WARDJet's J-Series water-only waterjets have been used to cut everything from a juicy peach to rubber gaskets to dry wall. Ken Carter, a sales representative at WARDJet, notes that the market for J-Series pure water waterjets has great breadth: "The interesting thing about dealing with water-only companies is that each of them has a different material with just as many material handling requirements."

WARDJet believes that the number of pure water applications is only limited by the needs and imagination of their customers, so they designed their J-Series waterjet to have a great deal of customization possibilities. "That's something a lot of waterjet builders don't want to get involved with," Carter says. "They want to sell a standard machine, but for WARDJet that's what we thrive on: customization." Production on a J-Series waterjet can be increased dramatically with the addition of any number of customizable elements such as additional cutting heads,

automated loading and offloading tables, material guides, optical eyes to streamline material handling, pinch feed rollers that can pull material from multiple rolls to allow stacking of as many sheets as desired, and automated bun loaders. Another unique feature of the J-Series is the ability to feed materials through the waterjet in both the X and Y direction, making it possible to load materials from all four sides of the machine.

The J-Series water-only waterjets are well suited for companies who are interested in cutting one part or one million parts. The J-Series waterjet generates traverse speeds up to 2500 inches per minute with high acceleration and deceleration capacity. "The WARDJet J-Series is built to easily meet the typical tolerances demanded by water-only cutting applications. We are able to keep the cost of the J-Series down while still using top-of-the-line drive systems developed in Germany that are ideal for these applications," notes Carter. "Making the J-Series affordable opens the door for use in new applications, and gives a faster return on investment."

The investment into a J-Series waterjet also includes the excellent technical support all WARDJet customers enjoy. "What customers love about WARDJet the most is our speedy response when they need help on anything from assistance with how to cut materials to adjusting a program for increased efficiency," adds Carter. "With a few clicks at the controller,



they can be in contact with our service department to get all the help needed in real time, live, as well as diagnose any issues the operator may have, or simply answer questions. Customers often don't comprehend the benefit of our remote control capabilities until the first time they call up. They can stand at the controller and know we are there to help, as if we were standing right next to them. Often we can help and encourage the operator with support and answers in minutes that might take other manufacturers' traditional service methods days."

The modular design of the J-Series reflects the WARDJet company ideals: small design changes can transform a standard waterjet into a personalized machine engineered for a specific application. Carter recounts one customer's experience with the J-Series: "they had a limited budget to start and bought what they could afford at the time. As their business grew by cutting on a J-Series, they traded their 30 HP pump that could run a single cutting head for a 50 HP pump and added a second cutting head. With that simple upgrade, their productivity increased. If their business continues to grow, they plan on getting another J-Series."

For more information, visit www.wardjet.com.

WARDJet's L-Series Waterjet System

WARDJet's L-Series waterjet is built using linear motors with a choice of 1 or 5 micron scales. The L-Series is both an abrasive and water-only system and end users specify the application prior to the final build.

“Most water-only applications tend to be low margin and high volume,” says Jeff Day, sales manager at WARDJet. “Operators are concerned with getting material on and off the table as quickly as possible and cutting with multiple heads.” While the WARDJet J-Series waterjet has many of these same options, the L-Series is faster and more accurate. Most owners run their system 24 hours a day, 365 days a year.

The L-Series improves on the water-only features of the J-Series by increasing the maximum traverse speed to 7,000 inches per minute or 116 inches per second. The L-Series also features accuracy and reliability by implementing a linear motion drive system in conjunction with 5 or 1 micron linear scale encoder.

The robust frame engineered for the L-Series was designed to give customers the opportunity to add a wide range of capabilities to a water-only or abrasive system even when traversing at 116 inches per second. Sales Manager Day adds “The L-Series allows us to be able to do things like mount

multiple 5 axis cutting heads, drills, tapping devices, cameras, and sensors. Other features like barcode readers, fiber laser markers, dot peen markers and ink jet printers with water resistant ink can also be integrated into the system to increase productivity.”

Since Return On Investment for water-only systems is typically determined by how quickly material can be loaded and off-loaded, WARDJet offers a wide array of material handling options and customizations. For example, the L-Series water-only waterjet is offered with an optional stainless steel conveyor belt to facilitate getting material into and out of the cutting area as quickly as possible with minimal labor. The stainless belts are easy to service as the chain returns under and outside the stainless steel lined tank with ‘quiet ride[®]’ guides designed by WARDJet to reduce noise emission, eliminate tracking, and facilitate tensioning of the belt. Photo eyes can be utilized to sense material location in the cutting area. Cycle start/stop buttons at strategic locations around the machine can be programmed to best suit the end-user’s needs. If material will be coming off of a roll, an optional pinch feed roller can either be integrated into the frame of the loading area, or be its own stand-alone unit that can pivot out of the way when not needed. Conveyor systems to load and unload sheets are



a widely requested option especially on water-only systems. WARDJet works with companies to customize how various options can be integrated and optimized.

WARDJet's philosophy is to design products in a modular fashion whenever possible so that waterjet owners have the option to upgrade existing WARDJet waterjets. The L-Series was designed with this expandability in mind. It is easy to add or remove features to tailor the L-Series to a specific application and improve production.

For more information, visit www.wardjet.com.

The following companies participated in the 2013 WJTA-IMCA Conference/Expo Live Demonstrations. Pictures appear on the front cover of this *Jet News*:

- Carolina Equipment & Supply (CESCO)
- GapVax, Inc.
- Hammelmann Corporation
- NLB Corp.
- Peinemann Equipment
- StoneAge, Inc.
- Stutes Enterprise Systems, Inc.
- Terydon, Inc.
- The Blast Bag Company, Inc.
- TurtleSkin WaterArmor by Warwick
- WOMA/Kärcher Group

Key differences between the J-Series and L-Series are:

Feature	J-Series	L-Series
Cutting speed	2000 ipm	7000 ipm (116 in per second)
Acc/dec values	0.2m/s ²	1.0m/s ²
Motors	AC servo	Linear
Linear positional accuracy per axis	120 micron	1 to 5 microns per choice
Abrasive cutting	No	Yes
Water-only cutting	Yes	Yes
Loading/unloading automation ready	Yes	Yes
Load from all 4 sides of the machine	Yes	Optional

Federal Signal to Open FS Solutions Location Near Tacoma, Washington

Federal Signal Corporation's Environmental Solutions Group has opened a new FS Solutions rental center in the Tacoma, WA, suburb of Lakewood on Sept. 30, 2013. Located at 10816 25th Avenue South, the new FS Solutions center is part of the company's expansion of FS Solutions locations and service offerings for industrial and utility customers in key areas throughout North America.

As the ninth FS Solutions rental center, the Lakewood location will stock high performance parts and accessories for Federal Signal's Jetstream brand of waterblasters, along with other makes and models of waterblasters. Customers will also be able to rent the full line of Jetstream waterblasters and tools, as well as StoneAge tooling for specialized waterblast cleaning applications.

"The new FS Solutions center in Lakewood further expands our North American footprint and allows us to increase product, service, training and rental offerings to industrial cleaning contractors and other industry professionals along the West Coast in the United States and Canada," says Tony Fuller, director of industrial sales for FS Solutions. "Having an FS Solutions center that can service markets like Vancouver, Calgary and Edmonton makes it even more convenient for our Canadian customers who need equipment rentals and parts."

The newest FS Solutions location will provide the rentals, used equipment, parts, accessories, service and training customers need to perform their jobs more profitably. As an authorized StoneAge repair facility, the new center has the machining expertise and tooling capabilities necessary to keep customers' StoneAge tools in peak condition.

Jetstream rentals come with all the advantages associated with the Jetstream name—ease of use, ease of maintenance and the ability to convert from 10K to 40K psi pressures. Customers can either pick up the unit they need, or FS Solutions can deliver to the job site. Waterblasting safety training can be provided by FS Solutions with every Jetstream rental.

To assist customers with their waterblast needs, the new FS Solutions center in Lakewood will be staffed by knowledgeable, highly-trained employees possessing a wealth of industrial cleaning experience. The new center will provide genuine OEM parts and factory-trained, certified technicians to offer recommendations and resolutions to any challenges customers may present.

"The sales professionals and service technicians at FS Solutions maintain



a well-earned reputation for providing our industrial cleaning customers with equipment evaluations, expert recommendations and solutions to the challenges of their particular applications," Fuller says.

Additional FS Solutions centers are located in Birmingham, AL; Long Beach, CA; Streator, IL; Highland, IN; Gonzales, LA; New Brunswick, NJ; Toledo, OH; Lexington, SC; and La Porte, TX.

To contact the FS Solutions center in Lakewood, Washington, call 253/584-0653. For more information about products and services available from the FS Solutions centers, visit www.fssolutionsgroup.com.

2014 WJTA-IMCA Membership Directory

Update your membership profile for listing in the **2014 WJTA-IMCA Membership Directory**. Your listing will also be accessible in the online **Member Search Directory**. Your listing is **FREE** as a benefit for members in good standing.

Update your membership profile online. Visit www.wjta.org and enter your username (your email address) and password to login and access your membership profile. If you forgot your password, please enter your email address, leave the password field blank and click "login." The system will email your password to you immediately. Information for the **2014 Directory** will be pulled from the database on **December 2, 2013**. Updates entered online after that date may not appear in print.

Consider advertising in the print **Directory** and reach the professionals who make purchasing decisions for services, equipment and supplies. An advertising contract can be found on the WJTA-IMCA website at www.wjta.org.

If you have any questions regarding the membership directories, contact the WJTA-IMCA office by phone at (314)241-1445 or email at wjta-imca@wjta.org.

Hughes' Pumping System Helps Clean Iraqi Sewers, from page 27

carefully considered. It was decided to use groundwater, which is available in abundance in the Middle East, even in desert areas. However, due to the salinity of groundwater, the pumphead was manufactured in corrosion resistant Duplex stainless steel compared to more traditional cast iron used on most sewer cleaning pumps.

The pumpset included a boost pump and high capacity stainless steel water filter to filter the groundwater before entering the pump.

The hosereel was supplied on a standalone frame to allow it to be positioned over manholes where a truck could not gain access. Pump controls were fitted to the hosereel to allow safe control of the pump pressure.

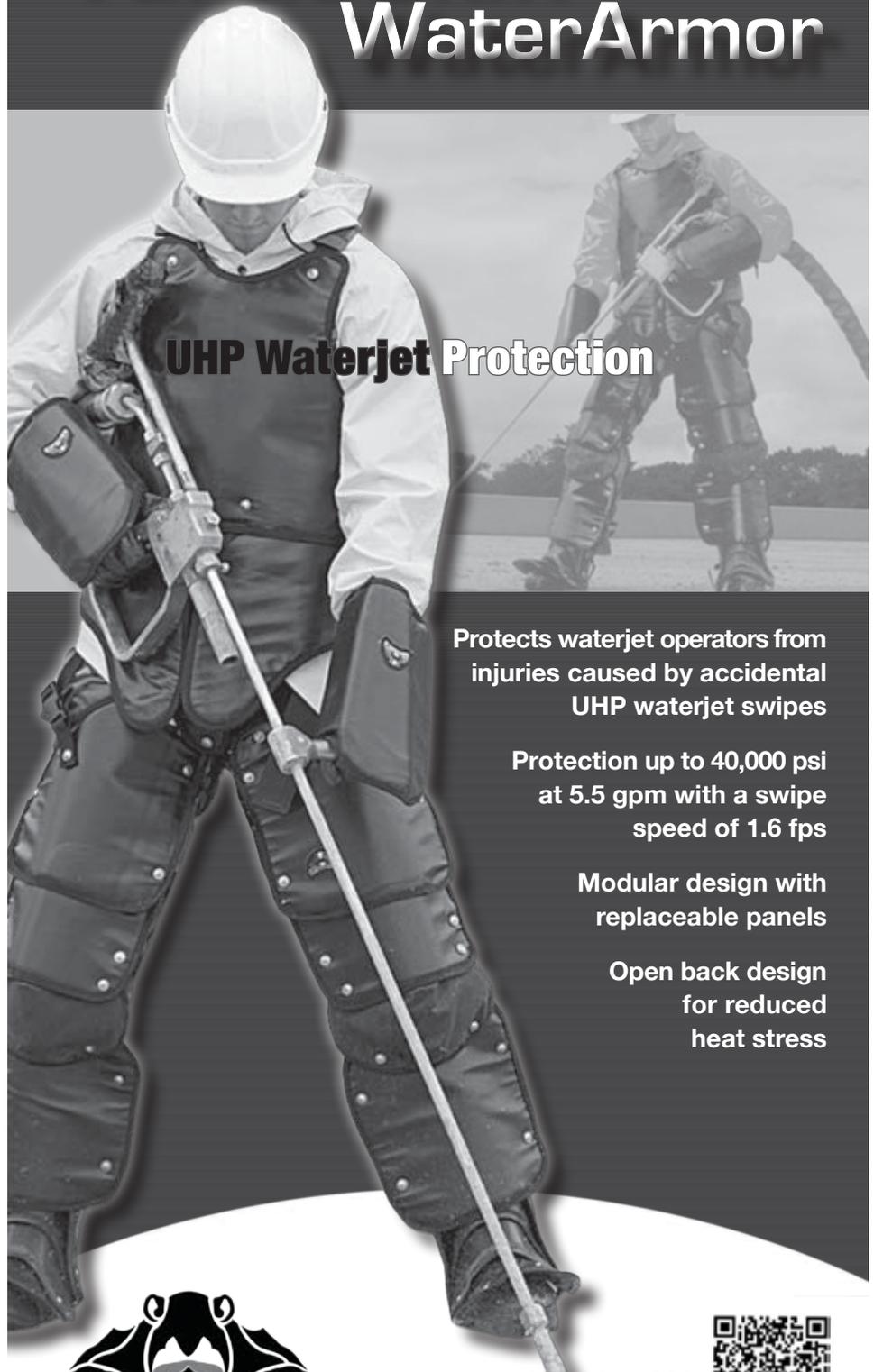
Hughes Pumps supply pumps as small as 65 hp for sewer cleaning applications and a range of pumps up to 2750 bar (40,000 psi) for industrial water blasting and surface preparation.

For more information, visit www.hughes-pumps.co.uk. ■



Emerging Technology, New Applications - Paper Presentations at the 2013 WJTA-IMCA Conference and Expo.

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Aqua Cutter Robot Reduces Cost on Singapore MRT Contract, from page 18

“The contractor had in total about 14,000 m² to remove and would conventionally have used jackhammer operators. Given the area, and the time schedule, he would have needed a large force of contract workers.

The contractor saved on the labor by using the Aqua Cutter’s hydrodemolition techniques, and he improved productivity with the system removing between 110 m² and 150 m² per day.

“To achieve this kind of work rate he would have had to use somewhere between 30 and 50 jackhammer operators.”

Christopher Parkhill says that engineers from Sweden, in association with AWE’s own personnel, undertook training for the Aquajet Robot, and that the machine was soon working to optimum levels.

The latest generation 710V robot is suitable for all operations such as horizontal, vertical and overhead applications.

Designed for working on bridges, tunnels, roads, parking garages or overhead roofs, the robot works typically 1000 bar pressure and 250 l/min. It handles removal depths down to approximately 1000 mm of concrete if required.

Extended free standing, vertical reach up to 7 m is achieved.

The 3-D positioning of the front power head gives the operator full freedom to reach all areas.

“When obstacles were encountered the machine simply went around them,” says Mr Parkhill. “A jackhammer operator would have been slowed down.”

Average concrete grade being worked on was 40, and the Aqua Cutter 710V was removing between 60 and 85 mm concrete thickness on average. Other areas required as much as 120 mm to be removed.

Featuring a sturdy base, the latest model also offers a 4 m extended working width as an option and track widths up to 1.64 m as standard, to ensure even further stable application.

Christopher believes that Aquajet’s technology has great potential in Singapore, especially now that the Singapore government is offering grants and incentives for contractors to modernize, and thereby reduce the reliance on contract workers from overseas.

For more information, visit www.aquajet.se. ■



Vertical operation starting from the bottom.



Continuing the operation up to 7 meter vertically.



Vertical removal under the box beams.



Patch removal on the floor.

**OMAX® Corporation's
20th Anniversary Event
Draws Huge Crowd,**

from page 26

training, research and development, and engineering efforts. Currently, the campus encompasses 130,000 square feet of space spread across three buildings.

During the OMAX 20th Anniversary celebration, attendees listened to special guest presentations on unique and diverse applications of abrasive waterjet cutting technology. USMC Gunnery Sgt. Matt Wolfe was in attendance to discuss how abrasive waterjet cutting technology was deployed to Camp Leatherneck in Helmand Province, Afghanistan. Military personnel used the portable abrasive waterjet cutting to fabricate parts less than 10 miles from where they would be used.

Dr. Robin Coope, group leader for instrumentation at the British Columbia Cancer Agency's Genome Sciences Centre, gave a presentation on how his team uses OMAX machines in the fight against cancer, specifically to manufacture parts for Barracuda, a robot that automates the selecting of a particular size of DNA strands to put into sequencing machines.

Steve Folin, founder and owner of Rickard Engineering & Design, shared how his investment in MAXIEM JetCutting Centers expanded his shop's capabilities and increased productivity. The breadth of materials that can be cut using MAXIEM waterjet technology paired with its low maintenance, has enabled Rickard Engineering & Design to double capacity each year.

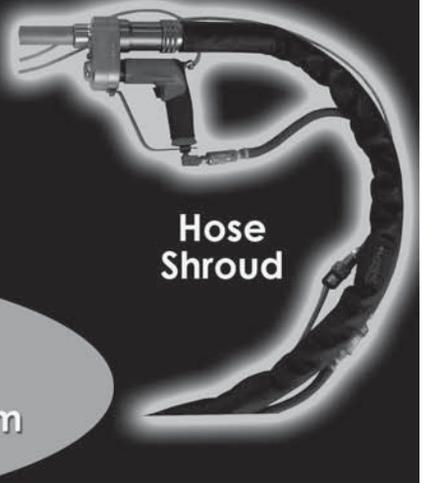
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Students of Aviation High School's FIRST Robotics team wowed the crowd with their robot, which was built using OMAX's advanced abrasive waterjet technology. Additionally, members of Brian Hough Racing were on hand showing how OMAX

abrasive waterjet technology was used in the development and maintenance of the team's Alcohol Funny Car.

More details about the event and technology can be found at www.omax.com/20years. ■

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OMAX® Unveils Advancements in Waterjet-Based Micromachining

With its new MicroMAX JetMachining Center, OMAX proves the speed, versatility and accuracy of abrasive waterjet technology now applies to the cutting of parts or part features smaller than 300 microns from a wide range of materials, including exotic metals, advanced composites, polymer thermoplastics and glass.

Ideal for prototype development and production runs, the MicroMAX is a highly rigid machine with a table size of 2 feet 4 inches by 2 feet 4 inches and an X-Y cutting travel of 2 feet by 2 feet. It utilizes advanced high-precision linear encoders, innovative vibration isolation and intuitive software control systems to achieve a position repeatability of 2.5 microns (0.0001") and a positioning accuracy of approximately 10 microns (0.0004").



The MicroMAX comes equipped with a high precision 7/15 Mini MAX-JET5i nozzle that features a 0.007" orifice and 0.015" mixing tube combination for quickly and accurately cutting delicate, complex patterns. Because it forms a jet stream carrying an extremely fine abrasive, the nozzle can produce a kerf as small as 0.015". The

machine also has advanced pressure controls for piercing delicate materials.

Like all OMAX JetMachining Centers, the MicroMAX is a flexible, cost-effective and beneficial alternative to conventional machining operations. Because waterjet-based machining is a coldcutting process, it eliminates thermal stress in the workpiece, preventing hardening and warping. The MicroMAX also enables manufacturers across all industry segments to accomplish quick turnaround of accurate parts without the hassle of tool changes or complex fixturing, as well as achieve smooth surface finishes without the need for secondary machining.

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The range of THE PEINEMANN 2LTC cleaning equipment is continuously being expanded.

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Water Jet Treatment at Sartell, MN, Clinic Offers Chance to Wash Away that Disc Pain, from page 19

believes not a lot of physicians are aware of HydroCision Inc.

“I work in patient care, and I was lifting a patient and that kind of ruined my back,” Rasmussen says. Her injury occurred when she was working with a 350-pound patient.

She says she has experienced lower back pain, swelling, and achy hips and legs because of the injury and had a lot of frustration before she tried HydroCision in August.

“I figured it was worth it to try this procedure because when you are in that much pain, you’re willing to do anything, and the minute the

procedure was done, that pain was gone immediately,” she says.

Who is a Good Candidate for HydroCision?

Those with a bulging spinal disc that has not ruptured into the spinal canal.

Someone whose pain has not improved after four or more weeks of conservative care, which typically consists of physical therapy, pain medications, and if necessary, epidural steroid injections.

A person with signs of nerve damage in the leg (severe weakness, loss of coordination, loss of feeling).

Source: HydroCision Inc.

After Undergoing HydroCision for Herniated Discs

In most cases, you will be able to go home the same day as your procedure.

Plan on bed rest with gentle stretching for several days.

You may need over-the-counter or prescription pain medication for several days.

Source: HydroCision Inc.

Article reprinted by permission from St. Cloud Times. The article originally appeared online at www.sctimes.com on September 30, 2013.■

Waterjet Parts Supplier Chukar Waterjet Launches New Website

Chukar Waterjet, Inc. has launched its new website at www.chukarwaterjet.com.

Chukar Waterjet supplies competitively priced quality waterjet parts for all major brands of waterjet cutting and cleaning equipment, including Flow International, Omax, KMT, Jet Edge and WSI. Dedicated to helping its customers reduce downtime and increase productivity, the Minnesota-based company offers same-day shipment and fast delivery of UHP pump parts, check valve parts, bleed down valve parts, valve and cutting head parts, nozzles, orifices, swivel parts, and tubing and fittings. It also supplies waterjet pumps and abrasive removal systems that are compatible with most manufacturers' waterjet systems.



In addition to waterjet parts and accessories, Chukar Waterjet offers a wide variety of portable waterjet equipment for rental, lease or purchase. Its mobile waterjet equipment is powered by a Cummins diesel-powered Jet Edge waterjet intensifier pump, delivering up to 4.3 gallons of powerful 55K Ultra High Pressure water per minute.

Chukar Waterjet offers fast friendly service, quick product searches of its huge parts inventory and knowl-

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edgeable consultations. The waterjet parts supplier also features a no-hassle warranty and return policy.

For more information about Chukar Waterjet, visit www.chukarwaterjet.com.

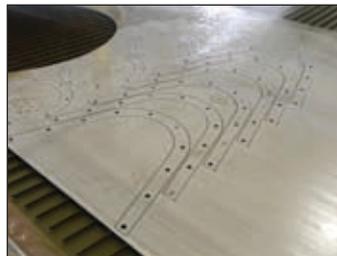
Material Handling Equipment Manufacturer Anderson-Crane Company Installs Jet Edge Waterjet to Increase Productivity, Improve Quality, from page 24

water filtration and chilling system that prolongs waterjet component life and reduces water consumption and sewage fees by recycling water.

Anderson-Crane decided to buy its waterjet specifically from Jet Edge for a variety of reasons, Crane notes.

“Jet Edge’s proximity to our shop is a unique benefit,” he says. “Being close to the manufacturer for support and training is important to us. We also wanted a dual gantry design, which we see as a more robust design than cantilever models offered by other waterjet firms.”

For more information about Anderson-Crane Company, visit www.screw-conveyor.com. For more information about Jet Edge, visit www.jetedge.com. ■



#304 stainless steel screw conveyor trough flanges and round inlet and discharge flanges. They are all 1/4-inch thick. These parts are now always cut on the waterjet, and go straight from the waterjet table to the welding production line with no cleanup in between required. Photo courtesy Anderson-Crane Company

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(continued on page 42)



Waterjet Technology - Basics and Beyond Workshop at the 2013 WJTA-IMCA Conference and Expo.

Hsiang Yu Machinery Representing Jet Edge Water Jet Systems in Taiwan

Jet Edge, Inc. has announced that Hsiang Yu Machinery Co., Ltd. has been selected as its newest waterjet systems dealer for Taiwan, R.O.C.

Hsiang Yu Machinery carries Jet Edge's full line of waterjet cutting and surface preparation equipment, including waterjet cutting machines, waterjet intensifier pumps and portable waterjetting systems. The company also carries Jet Edge waterjet parts and is authorized to service Jet Edge waterjet equipment.

Based in Nantou City in central Taiwan, with convenient traffic approaches to every city in Taiwan, Hsiang Yu Machinery Co., Ltd. has been a professional/leading supplier of waterjet solutions to Taiwanese industries since 1991, and has extensive experi-

ence in numerous industries, including steel, non-wovens, stone processing, construction, chemical/petrochemical, with plans to enter diverse fields of manufacturing including metal cutting, composites cutting, electronic PCB and other cutting related industries.

"Jet Edge is very proud to be represented by Hsiang Yu Machinery,"

says Jude Lague, Jet Edge president. "They understand the unique needs of Taiwan's thriving manufacturing industries, and their technical knowledge and experience will be a tremendous asset to our customers in Taiwan."

For more information about Hsiang Yu Machinery, visit www.hyum.com.tw or www.jetedge.com.



Industry Appreciation Reception held on Tuesday, September 10, at the 2013 WJTA-IMCA Conference and Expo.



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DERC Salotech Introduces New Standards for Cleaning Reactor Vessels During Process,

from page 22

The start position is the hood on top of the sliding valve. There is also a possibility to open the hood for inspection and maintenance on the StoneAge Torus TR 130.

In this project the reactor vessel was 4,5 meter high and 2,5 meter wide and equipped with two mixing blades.

DERC Salotech choosed to use the new StoneAge TR 130 because of its 3-D cleaning cycle, slim design and its OCV carbide nozzles. Resulting in a high long lasting jet for optimum cleaning effect.

To provide the high pressure water, DERC Salotech delivered an electrically driven high pressure unit of 800 bar and 100 liters/min. This unit was delivered on a stainless steel skid complete with charge pump, water tank and electric panel. Control of the high pressure unit is integrated in the PLC program and also monitored in the control room.



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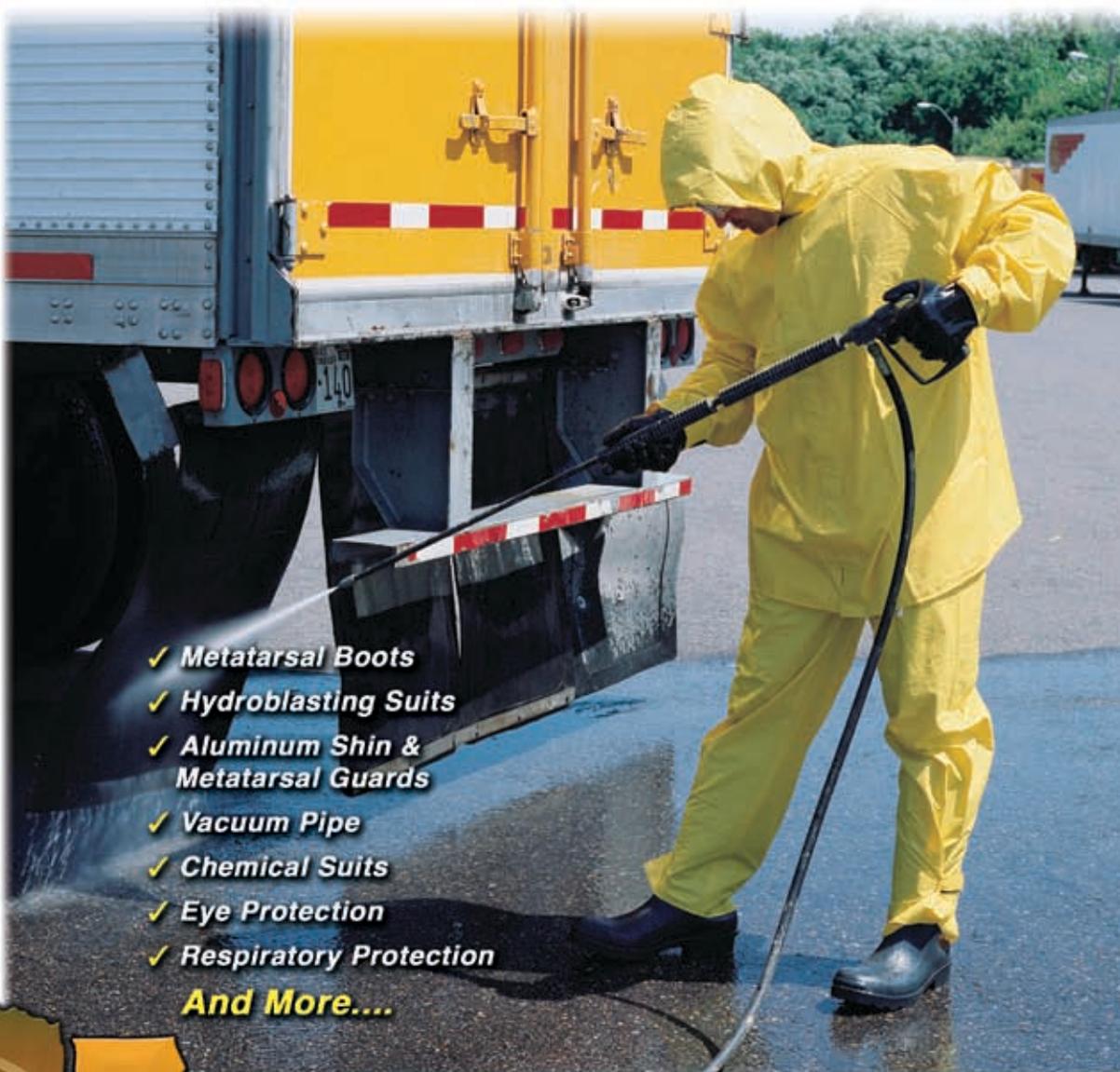
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The new universal Typhoon heads are stocked at all NLB branches and offer convenience to customers who wish to avoid changing nozzles. NLB also offers heads specially designed for cutting or for polishing, and these are generally recommended for superior performance.

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