

Jet Edge Celebrates 30 Years in Waterjet Industry



Jet Edge and sister company Chukar Waterjet helped stop the Gulf oil spill by rapidly building a waterjet system that was deployed 5,000 feet underwater. The system blasted away hydrate ice crystals that were clogging a containment system.



After Saddam Hussein's troops detonated and set fire to Kuwait's oil fields in 1991, Jet Edge waterjets were used to cut off the mangled wellheads so they could be capped.



Michael Waltrip Racing has twice run Jet Edge cars as a thank you to the waterjet manufacturer. MWR uses Jet Edge waterjets to cut more than 1,000 parts for each of their Sprint Cup cars.

See article on page 2.

On the Inside

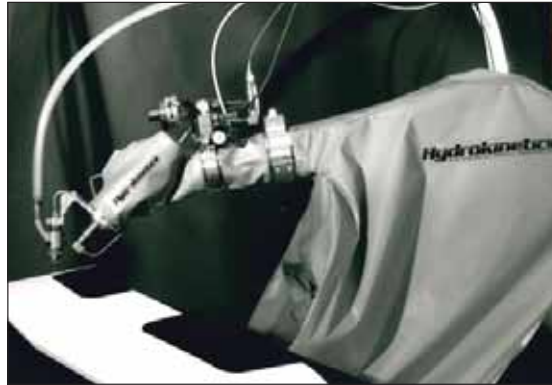
- Powering Robotic Waterjet Trimming Cells with
Jet Edge 60,000 PSI Waterjet Intensifier Pumps.....pg. 2
- UK Contractor Makes Significant Savings on
Underwater Bridge Columns Contract in Norwaypg. 4
- Diamond Technology Innovations to Introduce
Breakthrough in Waterjet Orifice Technologypg. 4
- Choosing the Right Garnet Abrasivepg. 6

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Jet Edge Celebrates 30 Years in Waterjet Industry

Jet Edge, Inc. is celebrating its 30th anniversary in 2014.

Founded in 1984, Jet Edge entered the waterjet industry during the industry's infancy and has grown to become one of the largest and most respected manufacturers of ultra-high pressure waterjet technology in the world. Jet Edge waterjets are used in a wide range of industries around the world, including automotive, aerospace, defense, industrial manufacturing, food production, and machine and job shops. Jet Edge's extensive product line includes precision waterjet cutting systems, waterjet pumps, and mobile waterjet cutting and surface preparation systems.



Jet Edge was briefly named Hydrokinetics before changing its name to Jet Edge. This is an early robotic system.

"We've come a long way since 1984," says Jude Lague, Jet Edge president. "We've seen waterjet technology evolve from its 36,000 psi (2500 bar) water-only past to today's sophisticated and highly precise 5-axis and robotic systems that can reach pressures exceeding 90,000 psi (6200 bar). Back in 1984, or even in 1994, waterjet was such a niche technology that many people hadn't even heard of it. Today, it's as common as any machine tool, and is used to manufacture count-

less everyday items, from sliced fruit to titanium joint implants."

(continued on page 23)

Powering Robotic Waterjet Trimming Cells with Jet Edge 60,000 PSI Waterjet Intensifier Pumps

Jet Edge, Inc. and Alliance Automation, LLC have announced that Alliance Automation is powering its latest generation of robotic waterjet trimming cells with Jet Edge intensifier pumps.

Featuring dual wall-mounted Motoman HP20D robots and Jet Edge's 60 ksi (4100 bar) iP60-50 waterjet intensifier pumps, Alliance Automation's new 6-axis robotic waterjet trimming cell leads the industry in precision and dependability with Motoman's ± 0.06 mm repeatability and Jet Edge's reliable tie-rod intensifier design. The cell's sturdy, compact frame design allows stability to both the tool and robots to ensure consistent tight part tolerances.

Most commonly used in the automotive industry, Alliance Automation's robotic waterjet trimming cell precisely cuts shaped parts with many angles from a wide variety of materials, including carpeting, fiberglass, foam and plastic. The system has numerous automotive interior applications, including trimming headliners, dashboards, dash liners, bed liners, wheel liners, door panels, trunk trim, car carpet, and acoustic dampening components.

Alliance Automation's Steven Cranston says the company's robotic waterjet trimming cell features numerous design innovations that distinguish it from other robotic systems and promise to increase productivity, lower operating costs and improve worker safety.

(continued on page 20)



Alliance Automation's robotic waterjet trimming cell allows many different parts to be programmed so tools or products can be quickly changed. Programming is accomplished via the Teach Trace Method. Control/Program Engineer Photo credit: Alliance Automation, LLC

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UK Contractor Makes Significant Savings on Underwater Bridge Columns Contract in Norway

UK contractor Rentajet Group (RGL) employed hydrodemolition techniques during underwater surface preparation on a bridge project in Northern Norway; ensuring significant cost savings and improved safety by eliminating the need for divers or other operatives to be in the work areas whilst material was being removed. As no jackhammers were used, the quality of bridge repair was also improved.

Specialist high pressure waterjetting contractor Rentajet Group Ltd (RGL) has taken delivery of an Aqua Spine system from Aquajet Systems for a bridge contract in Northern Norway that requires surface preparation work on the bridge columns using hydrodemolition techniques.

Constructed in the 1940s, the col-

umns of the Arstein Bridge in Northern Norway had suffered excessive degradation of the concrete and steel reinforcement, particularly in the splash zone.

The concrete-constructed, single carriageway bridge includes 11 pairs of columns. Each pair of columns is joined at a low level, but above water, by a crosshead beam.

Below the beam, the columns are 1500 mm diameter and above the beam to the underside of the bridge deck reduce to 1000 mm.



The Arstein bridge has eleven pairs of columns each joined at low level by a cross concrete beam.

The Norwegian contractor Multibetong appointed RGL to undertake the specified removal of all growth from around the columns, and any damaged

(continued on page 12)

Diamond Technology Innovations to Introduce Breakthrough in Waterjet Orifice Technology

Diamond Technology Innovations (dti™) announced plans to introduce a groundbreaking new orifice material for the waterjet cutting and cleaning industries.

After years of extensive research and testing, dti™ has successfully produced a lab-grown waterjet orifice that can perform in the harshest abrasive environments maintaining its structural integrity and jet-stream coherency for hundreds of hours. tetraCORE™ is cost-effective insurance against premature and unpredictable orifice failures, but offered at a cost per hour price point less than ruby and sapphire. dti™ President, Ted Jernigan, states, “tetraCORE™ will be one of the biggest advancements in waterjet technology since ROCTEC®.”



tetraCORE™ orifices as seen in the tetraCORE video available soon on tetracoreorifice.com.

tetraCORE™ is a tetrahedrally bonded material with extreme hardness characteristics that demonstrate excellent toughness and resistance to impact and erosion. This means less downtime, less cost per hour of operation and fewer scrapped parts.



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tetraCORE™ orifices will be available in all standard sizes and nozzle mount-styles for pure water and abrasive applications starting in April 2014. To learn more, visit tetracoreorifice.com or contact dti™ at (360)866-1337 or email info@dticore.com.

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Choosing the Right Garnet Abrasive

By: Alison Kulick, Marketing Specialist, WARDJet

Garnet has been used for decades as an abrasive in waterjet cutting and sand blasting because of its superior physical properties. When added to high pressure streams of water, garnet abrasive is capable of cutting through tough materials including steel, aluminum, stone, and Inconel.

With the variety of garnet abrasives available, how do you decide which is right for you? By understanding a little more about garnet, you are able to make an informed purchase on which type of abrasive would work best for your application.

Waterjets and Abrasive

A waterjet should be seen as an accelerated, controlled erosion process. A pure water waterjet (one without abrasives) is ideal for very soft materials, such as rubber, foam or food products. When abrasive is added, virtually anything can be cut or eroded away. By adding abrasive, you can greatly enhance the cutting capability of your waterjet and expand the variety of materials you can cut.

A waterjet will use anywhere from 0.3 lbs/min to 2.0 lbs/min of abrasive. This quantity is known as the abrasive flow rate and is determined by factors including the size of your pump and nozzle. The typical usage for a waterjet company is about one pound of abrasive per minute per cutting head.

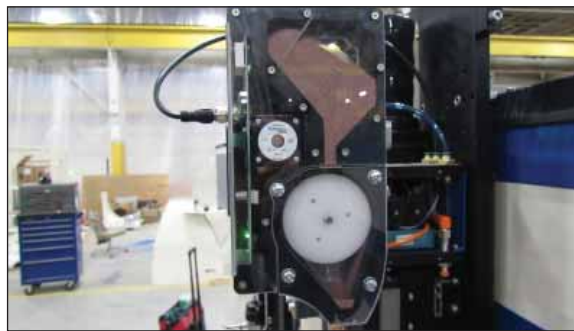
Advantages of Garnet for Waterjet Cutting

Garnet is a hard mineral typically rated between 7.0 and 7.5 on the Mohs scale (where diamond is 10 and talc

is 1). Also, well washed garnet abrasive does not produce a lot of dust when cutting like other processes might. Garnet is also relatively chemically inert and will not react with materials being cut, making its disposal simpler. These qualities are advantageous in waterjet machining.



Garnet abrasive is the most widely used type of abrasive in the waterjet cutting industry.



WARDJet's Infini Hopper allows you to store and change between multiple abrasive feed rates at the touch of a button.

Types of Garnet Abrasive

Types of garnet abrasive are determined based on their origin. Today, the largest sources of garnet sand used for waterjet abrasive are the Indian and Australian coasts. Understandably, the main producers of garnet abrasive are companies that are also located in Australia and India.

- **Alluvial garnet (river garnet)**
Alluvial garnet is particularly abundant in Australia. This alluvial garnet is typically found in deposits in river bends or natural hollows and has been smoothed by constantly running water. Both

river and the beach garnet suffer from the tumbling effect of thousands of years which rounds off the edges.

- **Rock garnet**

Rock garnet is produced in America, China, and western India. Here the garnet is embedded in a host rock which, after being crushed in mills and washed, is separated out. Being freshly crushed, this garnet has the sharpest edges and consequently performs far better than other kinds of garnet.

Abrasive Mesh Size

After it is crushed or collected, garnet abrasive is sorted according to mesh size. Grains 60 mesh and larger are typically used in sand blasting, and grains from 60-120 mesh are collected to be used in waterjet cutting. When garnet is introduced to the waterjet stream traveling at over 2000 mph, the abrasive is accelerated to supersonic speeds creating an extremely focused and powerful cutting tool that erodes material away, in most cases, without changing the molecular structure of the materials. Regardless of the application, larger grain sizes are used for coarser, faster work, and smaller sizes

(continued on page 18)

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High Pressure Equipment Company Acquires Staffordshire Hydraulics

High Pressure Equipment Company (HiP) has acquired Staffordshire Hydraulic Services Ltd. (SHS), one of the United Kingdom's leading distributors and designers of high pressure equipment. SHS has been a key distribution partner for HiP for over 40 years. Additionally, SHS markets its own line of standard and customized high pressure equipment with application in the oil and gas, power generation and other industrial markets.

Larry Loper, President of High Pressure Equipment comments, "SHS is a leader in the high pressure market with whom we have collaborated productively for many years. Together with our investment partners at Wasserstein & Co., we believe the talented management team and excellent product offering of SHS will enable us to better serve our customers in the North Sea market and throughout the United Kingdom."

For more information, visit www.highpressure.com or call (814)838-2028.

Super Products to Become Part of Alamo Group

Alamo Group Inc. has entered into an agreement to acquire the operating units of Specialized Industries, LP., including the businesses of Super Products LLC, Wausau-Everest LP and Howard P. Fairfield LLC. Super Products is a manufacturer of vacuum trucks and related equipment, parts and service, which is complementary to Alamo's

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VacAll operation. Wausau-Everest is a manufacturer of snow removal equipment which is complementary to Alamo's Tenco and Henke operations. And, Howard P. Fairfield is a dealer/distribution operation primarily in the New England area. Together the three operations had net sales of approximately \$139 million in the

fiscal year ending December 31, 2013. Total consideration for the purchase is approximately \$186 million, subject to certain adjustments. The purchase is anticipated to close in April and is subject to receiving regulatory approval and completion of other pre-closing requirements.

(continued on page 22)



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Guzzcavator™ - Combination Vacuum Loader and Vacuum Excavator

Guzzler Manufacturing has introduced the Guzzcavator™, a multi-purpose vacuum truck that combines the performance of the Guzzler CL vacuum loader and the Vactor HXX™ Hydroexcavator, without compromising productivity. The strength of the Guzzcavator is the versatility of the machine with its powerful air filtration system that can handle traditional wet/dry vacuum, and the large water supply for vacuum excavation applications.

“With feedback from our industrial cleaning professional customers, Guzzler developed a powerful machine that is 100-percent industrial vacuum truck and 100-percent vacuum excavator,” says Ben Schmitt, product manager at Guzzler Manufacturing. “The versatility of this machine allows industrial cleaning contractors to offer their customers additional services, creating new income avenues that can result in an improved bottom line.”

As industrial cleaning growth slows down, the Guzzcavator provides the typical cleaning contractor with a multipurpose vacuum truck that will allow them to expand their offerings. The multipurpose aspect will allow the typical contractor to operate their equipment throughout the year by offering additional services, such as tank cleaning and hydroexcavation applications, with one truck.

For the smaller contractor looking to expand a business, the versatility of the Guzzcavator allows the expansion of the business without increasing the fleet size. The increased utilization of equipment and employees will maximize profitability.

The multi-purpose Guzzcavator maintains Guzzler’s legendary industrial vacuum performance and filtration, combined with the powerful hydroexcavation capabilities of the market-leading Vactor HXX Hydroexcavator.

In addition to handling a variety of wet/dry industrial cleaning applications (such as cleaning and recovering solids and dry bulk powders, liquids, slurries and thick sludge), the Guzzcavator vacuum truck can also perform vacuum excavation

work including potholing, slot trenching, water valve box repair, locating existing fiber optic lines, cables and other utilities, and oil and gas field support.

“Vacuum excavation provides minimal ground disturbance and greatly reduces the risk of damage to existing underground utility lines,” Schmitt says. “With more than 19 million miles of buried utilities in the United States, vacuum excavation is an efficient way to locate underground utilities while protecting vulnerable and expensive infrastructure.”

When hydroexcavation is required the Guzzcavator blasts away soil with jets of up to 20 gallons of water per minute, at pressures up to 2,500 psi, depending on the pump selection, variable water pressure adjustment and nozzle tip configuration. The truck’s 1,300-gallon stainless steel water tank provides up to seven hours of continuous operation between refills.



The multi-flow water pump allows water pressure adjustment with the push of a button for digging in various conditions. Rated at between 10 and 20 gpm at 2,500 psi, the water system is powered by a hydraulically operated triplex piston water pump. The water pump can be mounted in an optional heated cabinet for protection against cold weather conditions. The optional water heater – 400,000 BTU/hr or 800,000 BTU/hr – is also available for hydroexcavation applications in cold weather or sticky clay soil conditions.

The Guzzcavator is equipped with a standard 5-ft telescoping boom with 270-degree rotation, providing more than 21 feet of reach from the center of the truck. The 8-in inside diameter hose allows easy passage of large or thick material. An optional extendable boom is also available.

For more information, visit www.guzzler.com or call 1/800-627-3171.

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UK Contractor Makes Significant Savings on Underwater Bridge Columns Contract in Norway,

from page 4



The Aqua Cutter robot with the bespoke 1500 mm diameter pile ring ensures that each circle is completed before auto indexing to the next level.

concrete below the crosshead beam down to the Fjord bed level, a depth of approximately 16 m.

The columns were prepared ready for stainless steel reinforcement to be fixed prior to reinstatement of a new concrete case.

The depth of damaged concrete ranged between 25-150 mm and in total more than 1500 m² was treated.

Hampshire, UK-based, RGL, ordered the new Aqua Spine system from Aquajet Systems UK distributor, Aquapower Ltd, together with a bespoke 1500 mm diameter pile ring multi-modular frame system with special clamp legs to fix to the column.

Working remotely from a barge, the operator was able to set the jet angle, number of passes and speed of travel of the hydrodemolition head. The system was set to make a controlled traverse in a complete circle of the column, before "auto indexing" to the next level and continuing until the cycle was completed – i.e. the length of the Aqua Spine at 6 m.

Divers then released the clamps and the frame was lowered by crane to the next level and reclamped. The cycle then continued.

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Jeremy Twigg, RGL's commercial director, confirms that, had the company employed divers for the underwater preparation work, it would have taken 10 times longer. "Plus," he adds, "the quality achieved by the Aqua Spine was so much better."

(continued on page 14)



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UK Contractor Makes Significant Savings on Underwater Bridge Columns Contract in Norway, from page 12

Supplied with a power and control unit, it features Aquajet's patented Intelligent Sensing Control (ISC). An advanced sensing system, it features no electronics, such as sensors or cables, exposed to the moisture environs – resulting in a more efficient production with fewer stops due to problems with, for example, sensors.

“We particularly liked the Aqua Spine's wireless controller and ISC sensorless control,” comments Jeremy Twigg. “It greatly helped towards ensuring continuous reliability in the harsh environment at Arstein - working in deep water and temperatures below 4°C.

“We have found the Aqua Spine to be the ideal solution both to the project requirements and to the tight schedule. It certainly allowed us to reduce the planned timeframe,” says Jeremy Twigg.

Between 50-250 mm of concrete per pass was removed depending on the condition of the concrete, with only damaged concrete being removed. On average each column was completed in 2-3 days.

The depth of the fjord was 16 m which meant as work progressed, underwater checks were carried out both by divers on hand and through underwater camera surveillance to ensure that an even finish was achieved across each column.

The project ran for a total of three months with all 22 columns being completed.

Aqua Spine is a modular hydrodemolition system for work on surfaces that previously had been inaccessible for the Aqua Cutter robots, such as very high constructions or difficult locations requiring equipment to be accessed through, for example, man-holes.

It can be extensively used on off-shore or onshore construction projects including hydro and nuclear power plants.

The Aqua Spine system can be positioned directly on the concrete surface by anchor bolts or supported by a carrier such as hydraulic platforms, sky lifts, cranes or scaffolding.

Two interchangeable rail systems are integral with the system's design – dual or triple.

For more confined areas, or when it is necessary to fix several accessible attachment points to the rail, the dual rail is preferred.

The Triple rail system is used for longer free spans of up to 6 m between supports, and it can be operated horizontally or vertically, as well as free standing.

As a multi-modular system, Aqua Spine can be tailor-assembled for each task with all sub-components fitting together. The system is suited for tough environments and features surface treated welded steel to ensure an extended lifespan.

Any of the Aqua Cutter power heads can be selected for the systems frames. Additional power heads are also available for confined spaces. The Aqua Spine can also be powered and controlled by any type of Aqua Cutter robot.

The traverse beam is supported on the frame by a heavy duty carrier operating on the Spine rail by four V-shaped roller wheels. It can be rotated +/-180 degrees for better access in both ends.

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



A unifloat barge and crane was supplied by Multibetong for positioning the hydrodemolition equipment alongside the bridges columns.




The column blasting rig was operating in sea water to depths of 20 m and temperatures below 4°C.



The hydrodemolition robot and Aqua Spine system was operated remotely on board the unifloat barge.



The pontoon was used to house the containerized hydrodemolition robot and power pack, the column blasting rig and a generating set. A shore-based truck mounted waterjetting unit provided water via high pressure hoses.



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As of 4-14-14

Live Demos



Boot Camp Preliminary

Waterblast Track

10:40 a.m.-11:25 a.m.	Mythb
11:30 a.m.-12:15 p.m.	Nozzle
12:20 p.m.-1:05 p.m.	Hose

Vacuum/HX Track

10:35 a.m.-11:35 a.m.	Hydro
11:40 a.m.-1:40 p.m.	Power
1:10 p.m.-1:40 p.m.	Ground

Combined Track

1:45 p.m.-3:00 p.m.	Hands Panel
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Safety



Exhibits



Training



Automation



Networking



Preliminary Schedule

usting
e Selection
Inspection and Record Keeping

excavation
r of Vacuum with Phil Stein
ding and Bounding

s Free - End User/Contractor
Discussion



Preliminary Schedule of Events

Monday, October 13, 2014

Setup for Exhibits and Live Demonstrations

Tuesday, October 14, 2014

8:00 a.m.-10:30 a.m.
Live Demonstrations

10:30 a.m.-5:00 p.m.
Exhibit Hall Open

10:30 a.m.-3:00 p.m.
Boot Camp

3:00 p.m.-5:00 p.m.
Reception in Exhibit Hall

Wednesday, October 15, 2014

8:00 a.m.-10:30 a.m.
Live Demonstrations

10:30 a.m.-1:00 p.m.
Exhibit Hall Open

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registration form on page 29
of this newsletter.

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Choosing the Right Garnet Abrasive, from page 6

are used for finer finishes. A key consideration is the momentum of each particle. The larger the particle, the greater the momentum and subsequent power the waterjet stream has for cutting harder and thicker materials.

Abrasive Cost

Abrasive represents the largest consumable cost associated with running the abrasive waterjet cutting machine. Prices for abrasive can vary from around 15 cents per pound to higher than 40 cents per pound, depending on the quality of the abrasive and where it is purchased. Since crushed garnet is typically found mixed with other minerals and must be blasted out of a mine, it costs slightly more than alluvial abrasive. Although crushed rock garnet is considered 'high perfor-

mance', some waterjet owners have seen better results using alluvial abrasive. In certain situations, the sharp grains of the crushed rock are critical to specific applications such as cutting horizontally stressed acrylic. Performing tests with both garnet types is recommended for waterjet owners to determine the ideal abrasive type. Alluvial is the more commonly used abrasive.

Some distributors may offer a reduced price per pound if the abrasive is purchased in bulk. You might even coordinate your purchase with a nearby branch location to reduce shipping costs. Be wary of signing lengthy contracts for abrasive unless you are 100% sure that the abrasive you are ordering is right for your long term needs.

In some cases, using a higher priced abrasive may actually reduce your hourly cost of operation. Good abrasive that performs well will allow you to cut material faster. As a result, you could get more inches of cutting done per dollar spent on abrasive. The operator must work to maximize cutting speed and should be aware of other factors that affect cutting speed such as the condition of the orifice and nozzle.

Some Qualities to Look for in Abrasive

Avoid purchasing abrasive on price alone because, as the old adage says, you will probably get what you pay for. Many factors determine a good

(continued on page 19)

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WARD Jet

NOT JUST A WATERJET...

Choosing the Right Garnet Abrasive, from page 18

abrasive, and the advantage of using a high quality abrasive is that you will get faster cutting, higher precision, and less frequent nozzle plugging.

Here are some qualities to look for in an abrasive:

- **Double Sifted**

When you purchase double sifted abrasive, the distributor uses a sieve to remove particles that are too fine or too large for the desired mesh size. Fine particles and large particles both contribute to nozzle plugging, inefficient cutting, and other problems. While there will always be a range of particle sizes in an abrasive, the narrower the range, the better.

- **Purity**

An abrasive with impurities will affect your waterjet's cutting performance. Impurities are made up of materials that are softer than garnet and can lengthen your cutting time.

- **Mesh Size**

A larger number represents a smaller size abrasive, so 100 mesh is smaller than 80 mesh. If cutting thin or softer materials and a good finish is needed, a finer abrasive such as 120 or 150 mesh is recommended. When cutting harder or thicker materials, choose a coarser abrasive, such as 50 mesh or 60 mesh. For a smoother surface finish, use a finer abrasive such as 100, 120, or 150 mesh. 80 mesh abrasive is the most popular abrasive size because it provides the greatest versatility for a wide variety of applications. Consult the manufacturer of your nozzle for recommendations.

- **Recyclability**

Some garnet grains in both alluvial and hard rock categories have fracture planes in them. This causes the grains to shatter into

smaller pieces when they hit the water stream prior to coming into contact with the material being cut. Even though this type of abrasive will provide a smoother edge finish, it will slow down the cutting of thicker materials and it cannot be recycled. Since recycling could allow waterjet owners to reuse approximately 50% to 80% of the original abrasive, it is advisable to use an abrasive that recycles well and cuts well.

Recycling Abrasive

WARDJet's patented WARD Pro abrasive recycling system can reduce consumable abrasive costs. The WARD Pro works by removing used abrasive from the waterjet tank with the AROS system. Through a series of processes, the WARD Pro then washes, dries, and separates the used abrasive according to mesh size. Both very fine and large particles are discarded during the recycling process, leaving you with dry, reusable garnet abrasive that can be put directly back into an abrasive hopper. The recycled abrasive can be used entirely on its own or mixed with new abrasive.

To be clear, there are similarities and differences between new and recycled abrasive. Both new and recycled abrasives are composed of a variety of mesh sizes. After going through the cutting process, the soft "filler" minerals found in new abrasive are shattered into extremely small particles and are subsequently filtered out by the WARD Pro. The resulting recycled abrasive has less "filler" material present and is more densely packed with the sharp-edged garnet that is doing the actual cutting. After more than 10 years of testing, WARDJet has determined recycled abrasive can cut with flow rates, cut speed, and edge quality as good as, and some claim better



The WARD Pro abrasive recycling system can recover up to 60% of your waterjet abrasive.

than, new abrasive. Certain limitations apply to recycling; please contact a WARDJet representative for more information or visit the WARD Pro web page.

Conclusion

Finding the right garnet abrasive is tantamount to successful waterjet cutting. By considering the type of garnet abrasive to use and weighing the advantages of cost, quality, source, and recycling capabilities, you are able to determine the best fit for your waterjet cutting application.

If you are still uncertain about which type of abrasive to use with your waterjet, the team at WARDJet would be happy to use their many years of experience to help you arrive at the best decision. Contact a representative today at 330-677-9100 or sales@wardjet.com. ■

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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New and Improved StoneAge Tools

The new AutoBox ABX-500 offers a hands-free alternative for cleaning pipes with rotary jetting tools. Safely manned from outside the blast zone by a single operator, this portable air-powered device can drive a wide range of hose sizes and pass couplings up to 1.75 inches for uninterrupted, consistent cleaning. The machine's pressurized roller design is simple to operate and adjust, with few parts to maintain and low operating costs. Weighing in at 90 lbs, the ABX-500 can be moved quickly and easily for maximum on-site flexibility.

The re-designed and upgraded 2-inch Badger (BA-LK) pipe cleaning tool with an all new head locking feature includes a spring loaded pin that ratchets the head to machined edges on the shaft. The head can only be removed from the Badger with a disassembly tool and not while in operation. Extensive testing and development has proven this to be a very effective additional safety feature.



2-inch Badger

StoneAge is offering a free trade-in replacement for old-style 2-inch Badgers with serial number 2361 or below. Contact your StoneAge Dealer or the factory to take advantage of this offer. StoneAge customers and Authorized Dealers must receive a Return Material Authorization (RMA) number prior to returning the tools to the factory. StoneAge requires the receipt of the old style tool prior to issuing the free replacement.



AutoBox ABX-500

Old Part #s:	New Part #s:
BA-BSPP4	BA-LK-BSPP4
BA-MP9L	BA-LK-MP9L
BA-MP9R	BA-LK-MP9R
BA-P4	BA-LK-P4
	BA 612-LK – Tool Kit

The re-designed Spitfire SPFR rotary shotgun tool replaces the female-style shaft with a male shaft/head connection to the head. The new design makes the shaft more durable, improving tool life, and also allows for two different head protection configurations that can be varied to best suit your application.



Spitfire SPFR Shotgun Tool

Head Options

Operators can choose from either a shielded head or bumper head version. The external shield option protects the tool from damage caused by lateral swinging of the tool. The bumper option is an alternative for those instances when debris gets stuck in the shield, preventing head rotation.

(continued on page 28)

Powering Robotic Waterjet Trimming Cells with Jet Edge 60,000 PSI Waterjet Intensifier Pumps, from page 2

The wall mounted robots allow for the first 2 axis to be mounted forward, over the part, Cranston notes. This feature allows for a larger work envelope and motion to work easier around larger shaped parts. The robots also are able to quickly retract to a home position out of the way for the loading and unloading of parts, drastically reducing cycle times and increasing operator safety.

The system lowers operating costs by eliminating the need for complicated trimming dies, he adds. It is set up so that many different parts can be programmed to make a quick change of tools or products. Jobs also can be installed with multiple parts to maximize productivity. In addition, the innovative design of the coil package on the robots allows for a quick change. All coils are a standard design (for each specific robot model), factory wound, pre-coned and pre-threaded.

Cranston says Alliance Automation chose Jet Edge waterjet pumps to power its latest systems based on Jet Edge's reputation for quality, support and free lifetime training.

"Knowing that Jet Edge is a leader in waterjet technology, we knew we could trust the dependability and consistency of the Jet Edge intensifier," Cranston says. "We have been involved in the robotic waterjet market for a number of years and utilizing the Jet Edge intensifier helps us to provide the product and support we need to satisfy our current and future customers." ■

Write for Us

Jet News accepts original industry-related articles that have not already been submitted to other publications. All submissions are subject to editorial review prior to acceptance. Once accepted, articles become the property of *Jet News* and cannot be reproduced elsewhere without permission.

What to Submit:

- Articles about new and innovative applications and equipment
- Case studies detailing implementation of a new product or technique
- Articles related to total quality management, management trends, marketing, state and federal legislative and regulatory issues, and safety issues
- Articles specific to any specialty area
- Career and student focused features


Jet News also welcomes letters to the editor and guest editorials.

Topics include, but are not limited to:

Abrasives, Water and the Environment
Advanced Industrial Applications
Advances in High Pressure Technology and Equipment
Automotive and Aerospace Applications
Cleaning and Coating Removal
Components and Systems
Construction and Non-Manufacturing Applications
Contractor Applications and Processes
Demilitarization
Drilling Applications
Excavation, Tunneling and Mining Applications
Hydrodemolition
Hydroexcavation and Vacuum Excavation
Industrial Vacuum Trucks
Jet Mechanics and Visualization
Jet-Material Interaction
Manufacturing Processes
Market and Future Needs
Novel Jets and Applications
Process Modeling and Control Studies
Rock Cutting
Safety, Training and Environmental Protection

Preparing the Manuscript

Articles should be approximately 1,000-1,500 words long and submitted via email as a Word document. Illustrations, photographs, graphics and charts are encouraged to complement the article. All accompanying materials should be labeled to provide appropriate originator credit. Suggested captions are required.



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Degrees and accreditations, professional titles and current position should be included. All statements based on published findings should be referenced appropriately. References should be listed numerically within the text and at the end of the article. Articles not meeting submission criteria may be returned for reformatting at the editor's discretion.

Send submissions to wjta-imca@wjta.org, attention: George A. Savanick, Ph.D. ■

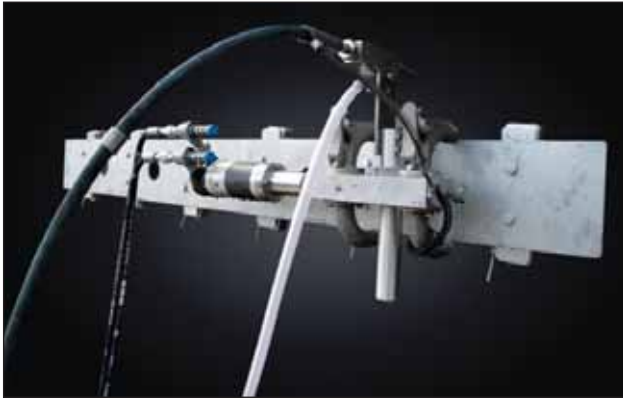
Comments Solicited on Improvements to Recommended Practices

Comments are solicited regarding improvements to the WJTA-IMCA publications, Recommended Practices for the Use of High Pressure Waterjetting Equipment and Recommended Practices for the Use of Industrial Vacuum Equipment. While both publications are reviewed periodically at the WJTA-IMCA conferences and throughout the year, your comments and suggestions for improving the publications are invited and welcome anytime.

Please address your comments and suggestions to: WJTA-IMCA, 906 Olive Street, Suite 1200, St. Louis, MO 63101-1448, phone: (314)241-1445, fax: (314) 241-1449, email: wjta-imca@wjta.org. Please specify which publication you are commenting on.

DERC Salotech Introduces Complete Solutions for Abrasive Waterjet Cutting

DERC Salotech designs and manufactures a complete line of tools and solutions for abrasive waterjet cutting applications. As a standard package DERC Salotech offers a starter kit with a magnetic Flex Track, power head, control panel, cutting nozzle and an abrasive hopper.



For special cuts and specifications, DERC Salotech designs and offers custom made solutions, like a manhole cutter, radius cutter, pipe cutting bands and an internal pipe cutter.

The DERC Abrasive Cutting System is easy to use and flexible to adjust to the application. The DERC Flex Track is made of flexible stainless steel and works on straight and large diameters. The standard length is 1.5 meter and can be coupled for cutting longer lengths. The DERC power head will be placed on the Flex Track. The DERC power head drives the abrasive cutting head movement and is air powered. The cutting head is adjustable in height. The DERC power head comes complete with mounting bracket for parallel and perpendicular cutting.

Pipe Bands

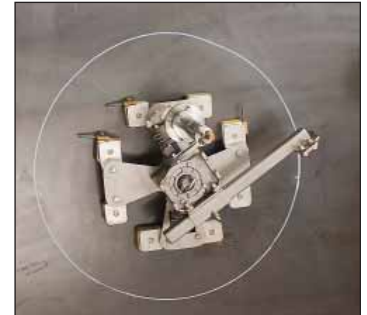
For all pipe cutting applications we offer the DERC Pipe Band. The pipe bands clamp around the pipe. The pipe bands are available in most sizes in 2-inch increments. The DERC Power head adapts directly to the pipe band.



DERC Salotech offers a range of radius cutters, manhole cutters and customized tools for a variety of cutting issues, including a radius cutter from 6 inches-12 inches and a manhole cutter from 24 inches. The DERC engineering department can design your customized tool.



When space or other restrictions prevent cutting from the outside, DERC Salotech offers a range of internal pipe cutters, making it possible to cut the pipe from the inside.



For more information, visit www.salotech.nl or call +31 (0)186 621 484 or e-mail: info@salotech.nl.

Super Products to Become Part of Alamo Group, from page 8

Super Products and Wausau Everest are based in New Berlin, Wisconsin, and Howard P. Fairfield is based in Skowhegan, Maine. The president and CEO of Specialized is Rod Winter and he will continue as head of the operations, which, upon completion of the transaction, will become part of Alamo's North American Industrial Division led by Jeff Leonard.

Ron Robinson, Alamo Group's president and chief executive officer comments, "These are excellent, well run operations that complement Alamo's existing equipment lines. This acquisition will broaden our product offering and enhance our market position in both vacuum trucks and snow removal, which are areas we have targeted for expansion. This is a very positive move for our Company."

Eric L. Blum, chairman and founder of ELB Capital, which is the managing partner for Specialized Industries adds, "We feel Alamo is a good strategic fit for our companies and they are dedicated to continuing the development that has been so successful under our ownership." ■

Vacuum Truck Rentals Opens Sulphur, Louisiana, Location

Vacuum Truck Rentals has opened its ninth rental location in Sulphur, Louisiana. The Sulphur location at 3253 Metric Drive geographically compliments the other eight locations in Deer Park, Texas; Geismar, Louisiana; Richland, Mississippi; Gaston, South Carolina; Worcester, Massachusetts; Oakland, New Jersey; Merrillville, Indiana; and Marietta, Ohio. Vacuum Truck Rentals maintains a quality rental fleet that includes industrial vacuum loaders, combination sewer cleaners with hydro excavation kits, DOT coded liquid vacuum tankers in mild and stainless steel, roll off trucks, 130 barrel vacuum tank trailers, liquid ring vacuum loaders, hydro excavation units, truck and trailer jettors, as well as road tractors with wet kits.

Graham Kinchen will be managing the new location, and the Sulphur office phone number is 337-476-2602.

Vacuum Truck Rentals offers daily, weekly, and monthly rentals as well as a "Rent to Own" option on all rental units, which allows customers to apply a percentage of their rent to purchase the rental equipment. Vacuum Truck Rentals is continually updating their late model fleet so there are always well maintained, quality used units available for sale for the cost-conscious buyer.

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Jet Edge Celebrates 30 Years in Waterjet Industry, from page 2



Jet Edge was one of the first waterjet manufacturers to introduce 90,000 psi X-Stream pressure pumps. The pumps cut up to 50 percent faster and reduce operating costs as much as 40 percent.

Lague credits Jet Edge's success to the company's commitment to helping customers solve their toughest manufacturing problems and willingness to engineer custom solutions.

"We were born problem solvers," Lague says. "Our company's founder



Jet Edge Founder Chris Possis started Jet Edge as a division of Possis Corporation. Dissatisfied with the waterjet pumps then on the market, he decided to build his own.

Chris Possis couldn't find a satisfactory waterjet pump, so he built his own. Since then, we've had the opportunity to help hundreds of customers improve their manufactur-

ing processes and we've responded to some of the world's greatest crises, including the Kuwait oil fires, the Kobe earthquakes, and the Gulf of Mexico oil spill."

Lague notes that Jet Edge's success in the competitive waterjet industry would not have been possible without the support of its loyal customers, dedicated employees and industry friends.



Jet Edge's EDGE X-5 5-axis waterjet with Aquavision Di controller cuts highly precise 3D parts from virtually any material.

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

New Hydrodemolition Tool Offers Faster Concrete Surface Preparation

Aquajet Systems AB has introduced a new accessory for faster concrete surface preparation and shallow concrete removal on roads, bridges, airports, harbors, sewage pipes, water reservoirs and dams, etc.

The Rotolance 2500 provides a cost-effective, fast and environmentally safe process for applications that successfully competes with all other tools used for this application.

The mechanism of material removal by waterjets makes more controllable roughness, creates a better bonding surface, and can be easily adapted for any specific application.

The Rotolance 2500 is an ultra high water pressure tool (uhp) and is considerably faster than conventional manual methods of concrete preparation and removal. It also provides considerable labor costs savings.

Possible operator injuries, including 'white finger' - caused by hand-held manually operated equipment' - is also eliminated with the vibration-free tool. Dust pollution is also eliminated.

The new tool provides the same constant performance 24 hours/day and can be fitted to all Aqua Cutter robotic equipment.

Featuring a 350 mm working diameter and a recommended water pressure of 1100-2500 bar, the traverse and working widths of the Rotolance 1250 are guided on the Aqua Cutter robot and monitored by the on-board control system.

All parameters, controlling speeds and traverse movements are gradually adjustable from the control panel on the robotic unit for maximum utilization of the tool.

The unit's spray bar can be equipped with up to 20 nozzles. It's hydraulically driven roller base features four

wheels and a pinion traverse drive for ease of mobility.

The hydraulic package incorporates quick connections and a coated steel protection splash cover with a replaceable guard mounted over the swivel beam.

The Rotolance 2500 will operate and clean on almost any surface. Other applications include paint removal from steel and concrete, plastic and rubber removal, rust removal from, for example, ship hulls or steel storage tanks, and other industrial applications requiring a robotic high pressure tool such as road marking removal and industrial services in the petrochemical industry.

For more information, visit www.aquajet.se.



Rotolance 2500

New NLB Pipe and Tube Nozzles Offer More Choices

NLB Corp. has introduced a line of high-pressure waterjet nozzles for cleaning small pipes and tubes that features five major styles and more than 200 models with standard drill patterns. Custom nozzles are also available. Included in the new line are:

- standard nozzles for applications requiring 15,000 psi, 20,000 psi or 40,000 psi (1,035 bar, 1,380 bar, or 2,800 bar)
- multi-row nozzles for applications requiring 15,000 psi (1,035 bar)
- button nozzles for applications requiring 15,000 psi (1,035 bar)
- evaporator nozzles for applications requiring 15,000 psi or 20,000 psi (1,035 bar or 1,380 bar)
- rodder nozzles for applications requiring 15,000 psi or 20,000 psi (1,035 bar or 1,380 bar)



Each of the new nozzles is designed for cutting or pulling, and to optimize water flow to clean pipes or tubes of a certain diameter. Drill patterns are precision machined for peak performance, with straight, forward-facing and/or backward-facing holes. Many models are offered with a choice of left-hand or right-hand threads. They thread easily onto one of NLB's flex lances or rigid lances or, in the case of the rodder nozzles, onto a rod.

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

Hughes Delivers Performance and Reliability in Extreme Environments

UK high-pressure waterjetting/pumping systems manufacturer Hughes Pumps has recently supplied three specially commissioned and precision engineered HPS2200 DNV Containerized Waterjetting Units to one of the oil and gas sector's leading offshore rental companies.

These waterjetting units will be used for subsea cleaning and cutting on offshore oil and gas rigs in the large area of the North Sea between the UK and Western Europe.

The Hughes' systems have been built around HPS2200 pumps that are suitable for pumping seawater with a performance of 83 lpm at 1000 bar (22 gpm at 15,000 psi). Hughes' unique integral reduction gearbox and SAE engine adapter, offered on all

Hughes pumps, allow for an extremely compact installation that reduces the equipment footprint to a minimum.

The pumpsets are mounted in dual certified DNV 2.7-1/EN12079 offshore acoustic containers having a maximum noise level of 85 dBA at 1 m. Considering the 150 kW (200 hp) rating of the pump-set and the low noise levels the containers dimensions were limited to 3.8 m long x 2.4 m wide x 2.6 m high x 8,000 kg (150" x 94" x 102" x 17,600 lb).

The system, with pneumatic pressure regulating valves with the controls on the outside of the container for instant on/off load control and full pressure



Twin doors on three sides for unrestricted access for maintenance.

adjustment, stainless steel water tanks and high capacity filtration, can also be remotely shutdown by the oil/gas rig central control system.

(continued on page 27)



HIGH & ULTRA HIGH PRESSURE

Hughes Pumps' flange mounting option makes the pumps very simple to install and more compact than other like-for-like units, but still powerful enough for the most arduous water-jetting applications. Pumps available in 10K, 20K and 40K PSI.

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HPS650

MultiCam Unveils \$1.5 Million in Upgrades to Headquarters

MultiCam has made major upgrades to its Dallas, TX, manufacturing facility worth a total of 1.5 million dollars.

The project encompasses several new upgrades and additions to its 110,000 square-foot facility, all providing significant benefits for MultiCam and its customers. Some of the upgrades include expanded conference rooms to provide for additional growth, upgraded offices for all administrative staff and the construction of a mezzanine providing additional floor space for inventory.

MultiCam's expansion also includes a new 10,000-square-foot demonstration facility capable of showcasing its full line of product including router, plasma, laser, waterjet and knife technology. The facility also features a new corporate training center now with the capacity to train up to forty people at a time.

The initial planning and analysis of production flow and future growth requirements started January 2013 and the actual construction took approximately six months to complete from the time it began in August 2013.

As part of the upgrade, the Six Sigma workplace organization philosophy

was implemented company wide, where smooth production flow was a key criterion and required moving both machinery and inventory. A major enhancement was the construction of a new Engineering/Production office area that provides significantly improved information flow between departments. Likewise, the electronics lab was doubled in size to meet increased production requirements.

"MultiCam makes it a top priority to offer the most innovative technology and best equipment in the industry, I believe we deliver just that," says Kelsey Smith, marketing director at MultiCam headquarters in Dallas, TX. "Whether our customers are looking for a standard machine for their application or require a custom machine built to achieve their companies goals, our new upgrades to our facility have the technology to make it happen."

Other upgrades to benefit production and improve employee morale include the expansion to the current lunch room with new serving counters,



refrigerators, and microwaves installed for all employees, new and improved plant lighting, and a complete overhaul to the factory air conditioning system.

For more information, visit www.MultiCam.com or on Facebook at www.Facebook.com/MultiCamUSA.

KF Machinery Distributing Jet Edge Waterjets in Minnesota, North and South Dakota, Nebraska, Western Wisconsin, Western Iowa

KF Machinery is now distributing Jet Edge precision waterjet cutting systems in Minnesota, North and South Dakota, Nebraska, western Wisconsin and western Iowa.

Located in Lakeville, Minnesota, KF Machinery offers full-service precision sheet metal manufacturing and forming equipment to manufacturers in a variety of industries, including preci-

sion sheet metal, metal fabricating, electronics, aerospace, agricultural, plate fabricators and vessel manufacturers.

KF Machinery was established in 2009 as the northern division of Koch Fabricating Machinery Co., of Addison, Texas, a leading supplier of metal fabricating and metal forming machinery and technologies since 1966.

For more information about KF Machinery, visit www.kfmachinery.com or call Jeff Fisher at 651-491-7566 or Todd Eccless at 612-220-7097.

For more information about Jet Edge, visit www.jetedge.com, call 1-800-JET-EDGE (538-3343), 763-497-8700 or e-mail sales@jetedge.com.

Hughes Delivers Performance and Reliability in Extreme Environments, from page 25

Operator and maintenance personnel were involved in the design of the DNV containers. All controls were mounted to the outside of the container, twin doors were fitted on three sides to provide unrestricted access for routine and major maintenance, with a full sized, removable louver mounted on the radiator end.

Hughes Pumps' equipment has played a major part in this company's offshore rental fleet for more than 25 years, delivering exceptional performance and reliability in some of the harshest environments imaginable.

For more information, visit www.hughes-pumps.co.uk or email sales@hughes-pumps.co.uk.

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OMAX Hires Chris Baer as Senior Sales Manager, Government and Education

OMAX® Corporation recently named Chris Baer its new senior sales manager, government and education. Baer is replacing Steve Brown, who retired on March 31, 2014, after 10 years with the company.



Chris Baer

Baer is responsible for all Department of Defense

and government accounts in the United States, working directly with government and in tandem with OMAX's government distributor Phillips Corporation, and handles future business development for government applications. He also oversees all sales to four-year colleges and universities as well as development of training curriculum for educational customers.

Prior to joining OMAX, Baer served as a director of strategic projects

within the industry. He holds a degree in chemical engineering, and in his 25-year career has been involved in process engineering, project management, and management of a wide range of sales, marketing and corporate issues and projects.

Mike Ruppenthal, vice president of North American sales at OMAX Corporation, says, "Chris is a great choice to handle two important and growing market segments for OMAX. Considering its longer sales cycle compared to commercial accounts, managing and growing government sales offers a significant challenge. In addition, abrasive waterjet is gaining acceptance in the university community as institutions more frequently apply the flexible and easy-to-use technology for their internal projects and prototypes. Chris's familiarity with a wide variety of abrasive waterjet projects and applications will enable him to help colleges and universities find the OMAX machines and systems best suited for their applications."

For more information, visit www.omax.com or call 800-838-0343.

New and Improved StoneAge Tools, from page 20

The re-designed Spitfire SPFR tools are in stock and ready for immediate delivery. StoneAge will continue to supply replacement SPF parts, but will no longer sell the discontinued models, listed below:

New Models	Discontinued Models
SPFR-MP9-B	SPF-P8
SPFR-MP9-S	SPF-MP9
SPFR-P8-B	
SPFR-P8-S	

Warning: StoneAge does not recommend pairing the new SPFR shaft and head configuration with a used SPF body. Attempting to do so may cause unintended wear and/or rotation issues, decreasing the life of the tool.

The new 40K psi Barracuda rotary shotgun tool is designed for use with flows as low as 1.68 gpm (6.36 L/min).

The new Barracuda utilizes a larger head to create more torque. This high-efficiency design allows the StoneAge Barracuda to be used with smaller flow pumps than previously possible and will also let you split the flow from one high pressure pump between two or even three operators at a time.

The centrifugal speed control and



**Barracuda Rotary
Shotgun Tool**

high pressure seals are the same as previous 40K psi models, and a lighter titanium steel keeps the weight of the tool minimal.

BC-H9-XXLF-C-TI SPECIFICATIONS

Maximum Pressure	40k psi (2800 bar)
Flow Range	1.68-3.12 gpm (6.3-11.8 l/min)
Inlet Connection	9/16 HP
Nozzles	4 x OS7
Head Diameter	2.45 in (62 mm)
Length	8.88 in (226 mm)
Weight	3.2 lbs (1.45 kg)

For more information, www.stoneagetools.com or call 866-795-1586.

TST Sweden Updates E-catalogs

TST Sweden's updated e-catalogs are now accessible online at www.tst-sweden.com. E-catalogs can be found on PRODUCTS pages or in the DOWNLOADS section (with catalogs, pictures, movies).

The catalogs are available in English, German and Swedish.

TST Sweden offers a complete range of protective clothing for operators working with hydrodemolition, waterjetting and blasting at ultra high pressures.

Medium Pressure Valves Feature New Ergonomic Handle

High Pressure Equipment now offers medium pressure valves with an improved ergonomic handle, offering smoother operation and lower torque. Featuring an adjustable stem to eliminate backlash in the connection, the new handle design gives users a greater feel in operations

HiP's new ergonomic handle is available on 20,000 psi medium pressure valves in sizes 1/4", 3/8", and 9/16" as well as 15,000 psi NPT connections in sizes 1/4", 3/8", and 1/2". High Pressure Equipment's medium pressure valves are engineered to the highest standards of repeatable quality.

Medium Pressure components use a compact coned-and-threaded connection which permits the larger bore sizes and increased flow rates common in this pressure class. Medium Pressure valves are available in 1/4", 3/8", 9/16", 3/4", and 1" O.D. tubing sizes and five body patterns to satisfy widely varied requirements. A full line of fittings, tubing and connection components are available to facilitate plumbing a complete medium pressure system.

For more information, visit www.highpressure.com, call (814)838-2028 or email sales@highpressure.com.

WJTA-IMCA Unveils New Mobile-Supported Web Page



WJTA-IMCA is excited to announce the launch of its new website, scheduled for release in early May. The new design places emphasis on the association's objectives of safety and technical innovation. The website uses responsive design to adapt to mobile devices, giving you easy access to the resources of WJTA-IMCA on the go.


Key additions include technical articles, up-to-date conference proceedings, presentations, and more. Contractors: be sure to utilize the **new anonymous incident reporting form**. Incidents or near misses may be published in Jet News or discussed in committee, absent any identifying information.

The website will continue to be updated with news and resources, so keep checking back and let us know what you think. For more information, or to suggest or contribute content, contact Peter Wright in the WJTA-IMCA Office.

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.



2014 WJTA-IMCA Expo
October 13-15, 2014
Ernest N. Morial Convention Center • New Orleans, Louisiana, USA

Registration Form

Name _____ Member # _____

Company _____ Title _____

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Information for name tag _____
Print name as you wish it to appear on your name tag

☐ **Expo Pass — One-Day** (select day below)\$30.00

- ☐ **Exhibit Hall - Tuesday, October 14**
Admission to the WJTA-IMCA exhibit hall, live demonstrations, boot camp and reception.
- ☐ **Exhibit Hall - Wednesday, October 15**
Admission to the WJTA-IMCA exhibit hall and live demonstrations.

☐ **Expo Pass — Two-Day**\$45.00

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Admission to the WJTA-IMCA exhibit hall and live demonstrations on Tuesday and Wednesday.
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- **Online:** register with a credit card at www.wjta.org.
- **Telephone:** call (314)241-1445 with credit card information.
- **Fax:** fill out the registration form with credit card information and dial, (314)241-1449.
- **Mail:** fill out the registration form and mail with applicable payment to: 2014 WJTA-IMCA Expo, 906 Olive, Suite 1200, Saint Louis, MO 63101-1448.

WJTA-IMCA Welcomes New Members

Corporate	Individual	Corporate Individual
Blue Water Environmental, Inc. <i>Gerard Philip Fadell</i> 29041 Wick Road Romulus, MI 48174 Phone: (734)947-5820 Fax: (734)947-5821	Ray Cantrell Canco P.O. Box 400 Chester, SC 29706 Phone: (803)581-2781 Fax: (803)581-1730 Email: raycantrell@canco-usa.com	Petra Hinke StoneAge, Inc. 466 S. Skylane Dr. Durango, CO 81303 Phone: (970)259-2869 Email: petra.hinke@stoneagetools.com
Gulf Systems, Inc. <i>Eugene R. Valentine</i> 2340 Larson Road S.E. Gnadenhutten, OH 44629 Phone: (740)254-1125 Fax: (740)254-1126	Gabriel Castillo TejasH2O 2204 Sanborn Amarillo, TX 79107 Phone: (806)584-0872 Email: TejasH2O@yahoo.com	Alexander Polhemus Veolia ES Industrial Services, Inc. 2000 N. Hwy 146 La Porte, TX 77571 Phone: (713)307-2137 Email: alexander.polhemus@veolia.com
Kandefer Plumbing <i>Jeff Kandefer</i> 2247 Union West Seneca, NY 14224 Phone: 716-668-4677	Jeremy Lane Thompson Industrial Services, LLC 104 N. Main Street Sumter, SC 29150-4948 Email: jlane@thompsonind.com	David Steele StoneAge, Inc. 466 S. Skylane Dr. Durango, CO 81303 Phone: (970)259-2869 Email: david.steele@stoneagetools.com
Transfer Oil S.p.A. <i>Ugo Ferrari</i> <i>Jörn Tramsen</i> <i>Tony Jakubiec</i> Via Sacca 64 Colorno, 43052 Italy Phone: [39](0521)3139 Fax: [39]0521-814160	Steve Mack Arrowhead Environmental P.O. Box 217 Windsor, VA 23487 Phone: (804)640-4481 Email: smack@arrowheadenvironmental.com	
	Jonathan Moore American Industrial Services 1973 East 1000 South Milroy, IN 46156 Email: jmoore@aecindy.com	
	Joe Siegel BP P.O. Box 2215 Decatur, AL 35609 Phone: (256)340-5491 Email: joe.siegel@bp.com	
	Charles D Walcot Walco Industries Ltd. 2266 Steelhead Road Campbell River, BC V9W 4P3 Canada Phone: (250)286-3663 Fax: (250)723-9635 Email: charlie@walcoindustries.ca	
	Dale Wilson K&D Industrial Services 30105 Beverly Road Romulus, MI 48174 Phone: (734)722-8922 Email: dwilson@kdigroup.com	

Index of Advertisers

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High Pressure Equipment Co.	www.highpressure.com	back cover
Hughes Pumps	www.hughes-pumps.co.uk	pg. 25
Jetstream of Houston, LLC.....	www.waterblast.com	pg. 5
MaxPro Technologies	www.maxprotech.com	insert
NLB Corp.....	www.nlbcorp.com	pg. 7
SPIR STAR.....	www.spistar.com	pg. 21
StoneAge, Inc.	www.stoneagetools.com	pg. 3
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WJTA-IMCA Order Form for Publications/Products

10-13

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Print name as it appears on card

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WAYS TO ORDER

Online: Go to www.wjta.org and click on "Online Store."

Phone: Call (314)241-1445 and have your credit card information ready.

Fax: Fill out the order form with your credit card information and fax to our 24-hour fax number at: (314)241-1449.

Mail: Fill out the order form and mail with applicable payment to: WJTA-IMCA, 906 Olive Street, Ste. 1200, St. Louis, MO 63101-1448.

Shipping and Handling Charges are calculated on a per pound basis that is based on shipping by FedEx Express Saver within the United States or United States Postal Service International Priority Mail for international destinations. When ordering online at www.wjta.org the shipping is calculated automatically. If ordering by fax, phone or mail, contact the WJTA-IMCA office for a shipping and handling total.

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_____	Proceedings CD of The 2013 WJTA-IMCA Conference And Expo	@ \$ 109.00	\$ 129.00	= \$ _____
_____	An Overview of Waterjet Fundamentals And Applications, Fifth Edition (2001)	@ \$ 55.00	\$ 70.00	= \$ _____
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NEW ☐ Waterjet Equipment Recommended Practices. English, Fifth Edition, 2013 - NEW, Revised and Updated

☐ Waterjet Equipment Recommended Practices. Spanish, Third Edition, 1994

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Contact the WJTA-IMCA office for shipping and handling charges before processing your payment.

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We can handle YOUR Pressure!

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