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The Space Needle Gets a Shower: Kärcher Cleans Seattle's Famous Landmark



Photographs courtesy of Kärcher GmbH & Co. KG.

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The Space Needle Gets a Shower: Kärcher Cleans Seattle's Famous Landmark

Kärcher cleaning team tackles dirt in the dead of night at Seattle's Space Needle.

Seattle's best-known landmark and popular tourist attraction was due for a bath. Now, thanks to the cleaning specialists Kärcher GmbH & Co. KG, the Space Needle is squeaky clean. The project, which began in mid-May 2008, was completed on June 25, 2008.

Kärcher, which cleaned Mount Rushmore in 2005 (see October 2005 *Jet News*), donated its services in the "green cleaning" of the Space Needle, which was built in 1962 and receives 1.5 million visitors per year. The German-based company's first high-profile cleaning project was the Statue of Christ in Rio de Janeiro in 1980. In 1985, Kärcher made its initial foray into the U.S., working with the restoration team at the Statue of Liberty to clean the granite base of the statue with high-pressure washers.

The ecologically friendly cleaning method Kärcher developed for Mount Rushmore was also used at the Space Needle. "The process is one-hundred percent green," says Frank Schad, press officer for Kärcher. "The cleaning process, accomplished with very hot water and high-pressure washers, replaces the need for detergents and ensures that the Space Needle is restored to its shining glory when we're done."

One team of three highly qualified rappelling professionals descends from

the top of the Space Needle, cleaning only with very hot water shot from high-pressure washers as they go. A rope-access safety supervisor mans the ropes and rappelling equipment from above. Kärcher contracted the rappelling team, based in Reno, Nevada, from Skala, Inc.

Cleaning via the rope-access technique, Schad notes, was refined when Kärcher cleaned Mount Rushmore and avoids having to erect costly scaffolding around the

Camas, Washington, near the Oregon border.

The challenges the Kärcher team faced in their advance planning, testing and analysis included the unusual shape of the Space Needle, the dense cityscape and the proximity of important buildings nearby, particularly the Experience Music Project museum designed by Frank Gehry. Since there are no harmful particles in the waste water, and

disposing of the water is in complete compliance with local, state and federal regulations, there was no need to process the waste water; the waste water flowed into the city's regular drainage system. High-pressure washers actually use less water than an ordinary garden hose, because although the spray looks like a lot of water, reducing the diameter of the tube means the water runs thinner yet faster.



Photograph courtesy of Kärcher GmbH & Co. KG.

Space Needle, as was done when the landmark was painted. The cleaning took place at night, from eleven p.m. to six a.m. each day, so that the Space Needle could remain open to the public for the duration of the cleaning.

Supervising the entire cleaning project was Kärcher's Thorsten Möwes, "an expert who knows everything about dirt," according to Schad. Möwes rappels down behind the team and inspects the cleaned surfaces, thus guaranteeing consistent results for the 605-foot structure. Assisting Möwes in the care of the machines during the cleaning are two Kärcher-USA colleagues based in

"We're using virtually pure water," Schad explains, "so it will drain just fine, even with the dirt it carries away." The surface grime on the Space Needle was comprised of grease from the Space Needle's SkyCity restaurant; pollution from carbon emissions; bird droppings; and plain old dirt.

Another big challenge, Schad says, was cleaning in the dark, the first time the Kärcher team has ever done that. Seeing the difference between the cleaned and yet-to-be-cleaned surfaces required additional light in the form of

(continued on page 8)



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Keeping Fuel Costs Down

By: James Lobusch, Regional Sales Manager, Jetstream of Houston

The average price of diesel fuel at the pump reached \$4.65/gallon on June 30, and the US Department of Energy expects it to average at least \$4.35/gallon for the rest of 2008 and 2009. Clearly, fuel costs are eating into everyone's profits and it is likely to stay that way for years to come.

High fuel prices are a fact of life, but operators can minimize fuel consumption and stay competitive by running their equipment smarter.

WATERJETS

High-pressure waterjet cleaners use a significant amount of diesel on the job. "The most important thing you can do to control fuel costs is to pick the right machine for the job," said James Lobusch, regional sales manager for Jetstream of Houston, a leading manufacturer of industrial high-pressure waterblasting equipment for industrial cleaning and surface preparation applications.

The problem is that people often take their most powerful waterblaster

to the worksite just in case. "It's like driving a Chevy Suburban," said Lobusch. "It's great for hauling six or eight people, but otherwise it makes no sense. Yet people take the Suburban to the job every day so if they have to suddenly haul all those guys, then they've got it covered."

Similarly, guys scope out a jobsite, then bring the biggest machine just in case they run into something they didn't expect. Lobusch suggested spending extra time assessing the job, then bringing in the smallest machine that will handle it.

The difference can spell the difference between good profits and just getting by. "Imagine you're doing a typical job that calls for 20 gallons per minute at 1,000 psi," said Lobusch.

"If you're running a 173 horsepower John Deere engine at 2,000 rpm, you're using 8.2 gallons of diesel per hour. Switch to a 325

(continued on page 18)

Save Fuel Driving

"Good driving habits add from 1 to 1.75 mpg," said James Weaver, a senior driver trainer for O & S Trucking, Inc., a Frankville, Miss., trucking company. He and James Pollitt, an owner-operator from Tollesboro, Ky., offered three simple suggestions:

- **Maintain.** Check tire pressure, wheel alignment, and air filters. Make sure you change oil and tune your vehicle regularly.
- **Slow down.** "Speed is the biggest factor in saving fuel," said Pollitt, who usually drives 58-62 mph. His on-board computer tracks fuel use. "If you're cruising at 60 mph and slow down even 1 mph, you'll see the indicator move," he said.
- **Predict.** Trucks burn fuel while idling and use the most fuel when starting from a stop. Weaver teaches drivers to look ahead and predict what will happen, so they can roll through lights rather than come to a dead stop.

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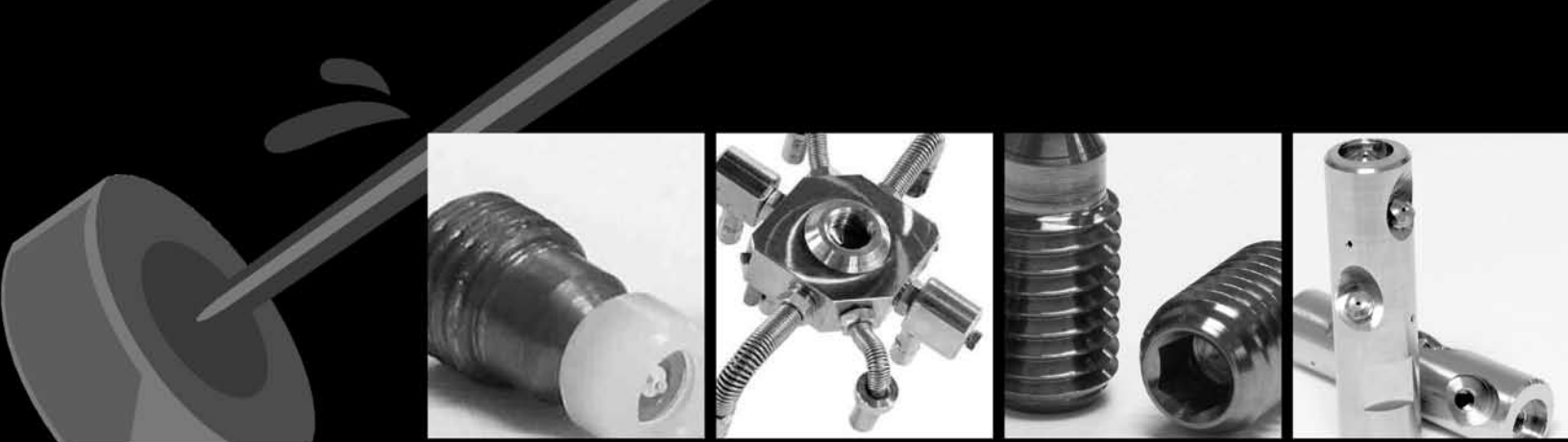
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Flow International Merger With OMAX Corporation Clears FTC Hurdle

Flow International Corporation announced today that the U.S. Federal Trade Commission (FTC) has accepted a consent decree with Flow which will permit the merger of Flow and OMAX Corporation.

“We are very pleased to have accomplished this critical step towards the merger of Flow and OMAX,” says Charley Brown, CEO of Flow. “Management teams of both companies can now focus on completing the definitive merger agreement and the necessary filings with the Securities and Exchange Commission. The transaction is expected to close during our second fiscal quarter, which ends October 31. We remain tremendously excited about adding the strengths of the OMAX team to our own. OMAX has been singularly focused and successful in the development, marketing and servicing of its OMAX JetMachining Centers, offered for sale through the most efficient distributor channel in the industry both domestically and worldwide. As our plans unfold, customers, distributor associates and team members throughout both Flow and OMAX can look forward to dynamic growth supported by even better products and customer service. Significant elements of this growth will come from the important distribution channel that OMAX has built plus the well respected OMAX brand name and product line up.”

The consent decree provides that Flow will make available to other abrasive waterjet companies royalty-free licenses to OMAX's U.S. Patents 5,508,596 and 5,892,345, which relate just to the controllers used in waterjet cutting systems. The licenses do not include any transfer of technology, will not cover any other patented equipment or processes owned by Flow or OMAX, do not apply to any intellectual property outside of the US, and expire in only five years.

For more information, visit www.flowcorp.com or www.omax.com.

2009 American WJTA Conference and Expo
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Announcement and Call for Papers

See information enclosed with this newsletter



Commemorative Pen Enclosed With This Issue

Congratulations to the WaterJet Technology Association, celebrating its 25th Anniversary this year!

In recognition of this special event and as a token of thanks for your continued involvement in the association, WJTA has enclosed a special gift for you – a souvenir pen commemorating the 25th Anniversary.

Watch for a history of the association's activities and accomplishments during the past 25 years in an upcoming issue of *Jet News*.



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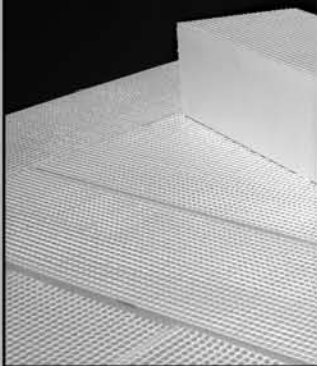
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Keys To High-Pressure Hose Safety

By: Paul Webster, Engineering Manager, Parker Hannifin Corp., Polyflex® Business Unit
Stephen Johns, Marketing, Parker Hannifin Corp., Polyflex® Business Unit

Last issue, we began a discussion of manufacturing techniques and accessories used to build a safe and reliable high pressure hose.

Flex Lances

Flex lances are specifically addressed in this article because of their close proximity to the user and may be used in handheld applications. Reiterating what has already been presented, the most common point of leakage is at the fitting. The hose may become kinked or the outer cover is worn away and the wire reinforcement becomes corroded.

Corrosion may account for a loss of the hose's rated burst strength. As the wires corrode, they weaken, and the burst pressure becomes lower.

Because of the nature of flex-lance fittings and their one-piece design, there is no hex or parallel flat to grasp onto to tighten the nozzle, adapter or stinger. Therefore, the common method is to use vice grips, a vise or a pipe wrench to hold the fitting.

Although it is very infrequent, squashing the fitting oval is possible, and it is a requirement for the user to examine the fitting for possible damage after installing the nozzle or adapter. Measure the roundness of the fitting. It should not be out of round more than .01 inches.

The use of tube-lancing machines for cleaning tube bundles has become fairly common today. This moves the operator away from the lance and waterjet. Several manufacturers offer mechanized lancing machines that increase operator safety, which increase the life of the flex lance and

are often more productive. Follow the WaterJet Technology Association's *Recommended Practices For The Use Of Manually Operated High Pressure Equipment* and the safety guide accompanying the hose and equipment.

Evaluation of Hose for Service

Make it standard practice to inspect the ultrahigh-pressure (UHP) hose prior to use. If the assembly is equipped with a burst shield, make sure it has not pulled off of the fitting or out of the stiffener, exposing the

hose. Look for indications of leaks at relief holes.

If the hose has an abrasion shield, inspect for areas that are worn through exposing the hose to abrasion. These areas can be repaired inexpensively.

In the case of flex lances, look for exposed wires. This is a serious condition and demands immediate removal from service. Check if the cover is wrinkled behind the fitting, which indicates a kink. Also look for

(continued on page 26)

The Space Needle Gets a Shower, from page 2

headlamps. The risk of rappelling in the dark is minimized by using the redundant system of gear in place for all cleaning professionals.

The family-owned Kärcher was founded in Stuttgart in 1935 by the entrepreneurial engineer Alfred Kärcher. The company first produced electric heaters and specialized in industrial heating equipment. With the development of a submersible heating element, the company's future was sealed, and by 1950 Kärcher had designed and patented his first hot-water high-pressure cleaner. The company, which has maintained its headquarters in Winnenden, near Stuttgart, since 1939, has 6,591 employees and a sales volume of 1.38 billion Euros per year.

Coincidentally, Seattle's Space Needle was also first conceived in Stuttgart. In 1959, inspired by

Stuttgart's tall TV tower, the first ever of its kind, the World's Fair Commission chairman made a sketch that was brought to fruition by the time the 1962 World's Fair opened in March of that year.

Kärcher decided early on to donate its services in the cleaning of monuments and landmarks both as a goodwill gesture and for the opportunity to receive valuable feedback from workers, officials and scientists involved in the cleaning process. This feedback in turn enhances Kärcher's research, development and manufacture of new products, their primary business.

"Cleaning the Space Needle is an honor," Schad adds. "The people of Seattle are rightfully proud of such a national treasure in their midst. Now it will be sparkling clean once again."

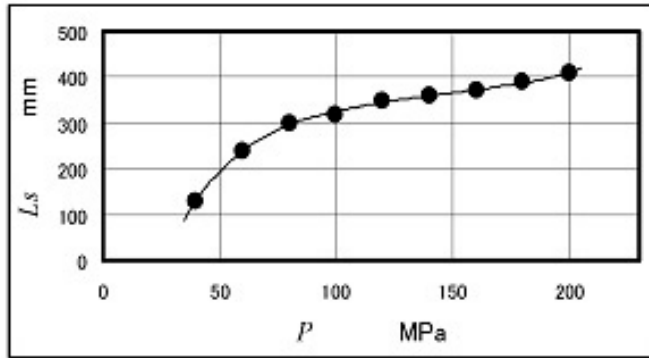
Effectiveness of Helmet and Face Shield For Waterjetting Protection

Katakura and Guo* presented research study in this subject, aiming to provide data necessary for establishing industrial safety standards.

A waterjet with a diameter of 0.2 mm and up to 200 MPa pressure was used in this study. Commonly used industrial safety helmets were cut in halves and then impacted with the jet at different angles, different stand-off distances, and different pressures. The helmet is made from fiber-reinforced plastics (FRP). Its thickness varies between 1.4 mm and 2.8 mm. The face shield was simulated with 2 mm thick acrylic resin plates. The time from the jet exiting the nozzle till penetration was recorded with a hand-operated stop watch. Jetting was stopped after 30 seconds if no penetration occurred.

The results are summarized as follows:

- No penetration occurred on the helmet within 30 seconds of impact if the jet is 200 mm away, shooting at the front of the helmet, and the pressure is below 40 MPa.
- Penetration occurred 100% on the helmet within 30 seconds of impact if the jet is only 100 mm away, shooting at the front of the helmet, and the pressure is above 100 MPa.
- When the pressure reached 200 MPa, the helmet was penetrated at the weakest spot within 30 seconds when the jet was at 350 mm or within 10 seconds when the jet was at 320 mm. The



helmet was not penetrated within 30 seconds when the jet was 410 mm or further away.

- The chance of penetration is higher if the jet hits the side (instead of front) of the helmet.
- The jet aiming at an angle (instead of perpendicular to the target surface) has a lower chance of penetration.

- The simulated face shield (2 mm thick acrylic resin plate) was not penetrated within 30 seconds under 200 MPa if the jet was 0.5 meter or further away. The plot to the right shows the safe distance at different pressures.

Their conclusion was that the commercially available helmets and face shields are useful protective devices if the jet is kept at a suitable distance away.

* Katakura, H. and Guo, C. (2006) Research on personal protective devices for water jetting operation – performance of head and face protectors, Proceedings of the 8th Pacific Rim International Conference on Water Jet Technology, Oct. 10-12, Qingdao, China, Paper 42.

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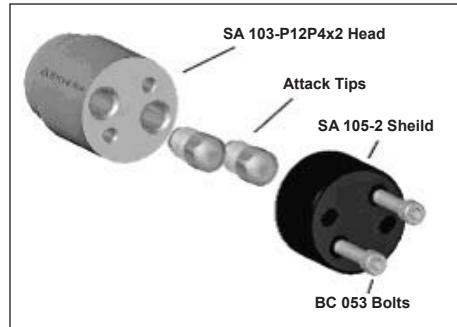
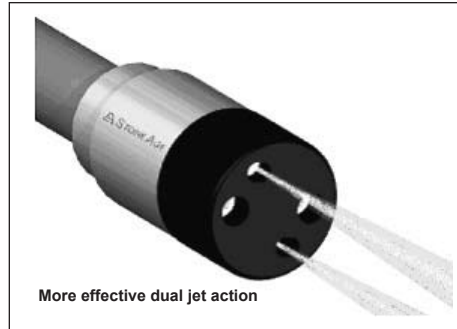


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Owning Versus Renting Equipment

By: BT Steadman, Vacuum Truck Rentals

The own versus rent decision is one that all contractors face at one time or another. Often times, this decision can be the difference between success and failure. Here we will examine the pros and cons of both to better understand your options.

Owning

When you own a piece of equipment, you have no limits on the use of that equipment or the length of time that you will own it. Owning makes sense when you have a long term need for the equipment. Generally, if a contractor has a commitment for over one year, owning that equipment can be a better option. When the time comes that he no longer needs the equipment or needs to replace it, he can sell it for its resale value or possibly trade it in for a new one. Owning equipment requires a large upfront cost. Typically this cost is financed, either with a traditional term note or a lease. Financing requires owners to agree to make payments for some time into the future. Equipment ownership can also have adverse effects on company resources by tying up monies that otherwise could go to other expenses. Equipment continually requires maintenance and upkeep that can be a large expense if a company is not equipped with facilities, personnel and equipment to handle maintenance and upkeep. Insurance, taxes, and depreciation are other costs associated with owning equipment.

The single largest obstacle most owners must overcome is utilization. Utilization is the key to owning equipment. If the owner cannot keep the equipment utilized, the cost of ownership skyrockets. Idle equipment quickly becomes a drain on company resources.

Renting

More and more contractors today are finding that renting equipment can be very helpful for their business. Renting does not require large upfront costs. Renters pay a fee to use the equipment. This fee is based on how much they use the equipment. When finished, the renter simply returns the equipment and the fee stops. There are no long-term commitments like with equipment ownership. Maintenance and upkeep are typically included in the rental agreement.

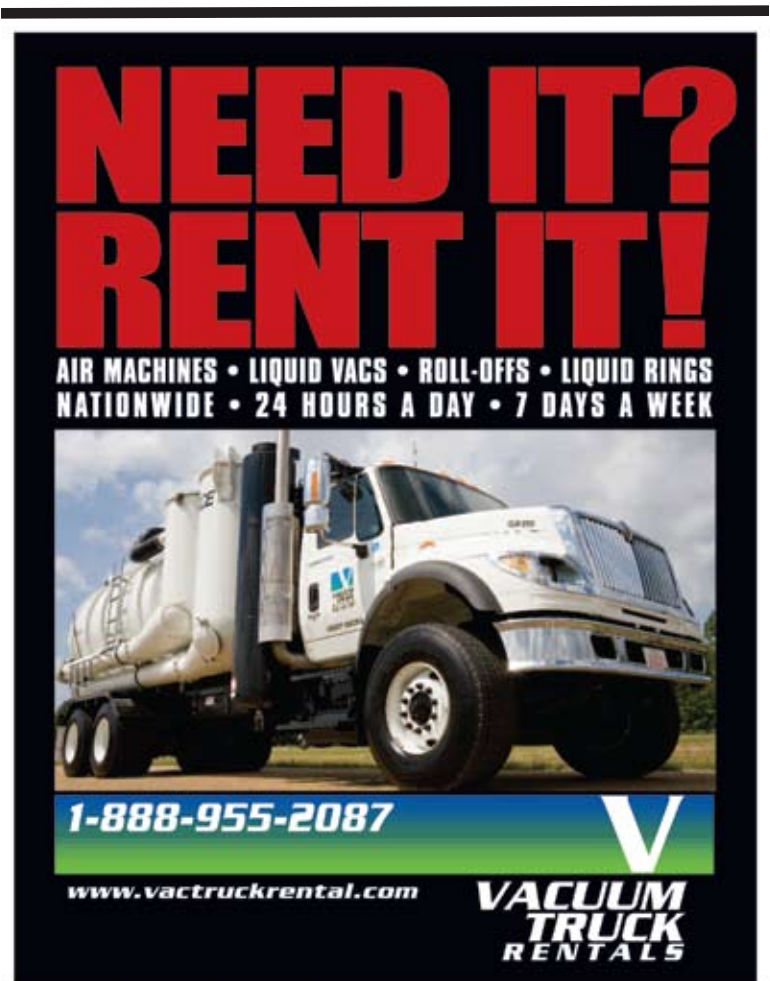
This gives contractors the ability to focus on the job at hand and not concern themselves with mechanics and parts inventories. Typically, rental payments are a deductible business expense.

Other reasons why renting makes sense

Business is seasonal in many parts of the country. As mentioned above, utilization is the key to owning. In some parts of the country, good working conditions only last for six months or less. The rest of the year, your equipment will be idle.

Renting allows contractors to try out different types of equipment prior to purchasing. Some contractors may not know which type of equipment is best suited to their needs and renting can help them with this decision.

(continued on page 24)



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Jet Edge Announces New Corporate Video Featuring Michael Waltrip

The new Jet Edge, Inc. video featuring Michael Waltrip, owner of Michael Waltrip Racing (MWR) and driver of the No. 55 Napa Auto Parts Toyota Camry in the NASCAR Sprint Cup Series, can be viewed at www.jetedge.com.



Michael Waltrip

In the video, Waltrip and Dr. Eric Warren, MWR's vice president and technical director, explain how MWR is successfully using Jet Edge's top-selling High Rail Gantry Waterjet System at its fabrication shop in Cornelius, N.C., to cut parts for its three NASCAR Sprint Cup Series teams (#55 Cup-Michael Waltrip, #44 Cup-David Reutimann, #00 Cup-Michael McDowell) and Nationwide Series team (#99-David Reutimann).

Warren notes that MWR already is seeing substantial time and cost savings with Jet Edge waterjet technology. He estimates that they are saving about \$130,000 per year by cutting the racecars' polycarbonate splitter panels in-house. MWR also is saving hours of time by rough cutting steering spindles on the waterjet versus a bandsaw. This process used to take three to four hours; it now takes 30 to 35 minutes.

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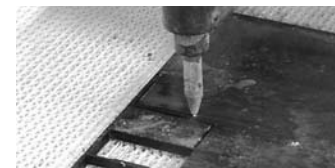
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Letter To The Editor

Dear Sir:

I am prompted to write to you following the appearance in the June issue of Jet News of an article on the Affect of Turbulence which I received on June 27, 2008.

On June 26, 2008, I had received from Mr. Ted Rulseh, Editor of the Cleaner, approval to submit to him for consideration a paper entitled "Jetting with SUPER-WATER and plain water: why do they differ."

The close juxtaposition of the article on turbulence and my own intended article are such that I am compelled to write to you.

The difference between a SUPER-WATER jet and a plain waterjet is explained by consideration of turbulence.

Plain water consists of separate molecules of water or at best groups of 6 molecules. It is no wonder that such a system would be characterized by turbulence, each molecule being capable of random movement.

By contrast SUPER-WATER molecules are capable of bonding or binding approximately 3 million molecules of water and these act in concert with one another. It is for this reason that turbulence is considerably dampened in solutions of 0.3% SUPER-WATER.

All of the contortions that one must go to in order to obtain a collimated jet from a turbulent plain waterjet are obviated with a SUPER-WATER jet. No need exists for flow straighteners and considerations of conditions such as pipe smoothness, elbows, bends or adapters are unnecessary. Solutions of SUPER-WATER essentially produce piston-like

flow. Furthermore, there is essentially no Rayleigh shearing and this is very evident in photographs of SUPER-WATER by itself or with abrasives.

For the past 35 years I have noted how the influence of mechanical engineering, in the absence of any consideration of chemistry, has resulted in higher and higher pressures being used. As a consequence waterjetting has become more and more expensive because of equipment requirements such as pumps, valves, lines and so on.

By contrast as can be seen under the heading below of <http://www.berkeleychemical.com/history.html> lower pressures are more effective.

My best regards.

Sincerely yours,

W. Glenn Howells, Ph.D.

President, Berkeley Chemical Research Inc.

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Safety Committee Solicits Comments On Improvements To Recommended Practices

The WJTA Safety Committee hereby solicits comments regarding improvements to the publication, Recommended Practices for the Use of Manually Operated High Pressure Waterjetting Equipment. While Recommended Practices is reviewed periodically at the biennial conferences of the WaterJet Technology Association, your comments and suggestions for

improving the publication are invited and welcome anytime.

Please address your comments and suggestions to: Safety Committee, c/o WJTA, 906 Olive Street, Suite 1200, St. Louis, MO 63101-1434, phone: (314)241-1445, fax: (314)241-1449, e-mail: wjta@wjta.org, web site: www.wjta.org.



Airbus Awards Multi-Million Dollar Contract

Airbus has awarded Flow International Corporation its entire multi-million dollar contract to manufacture and install multiple Composite Machining Center (CMC) abrasive waterjet and routing machine tool systems. These machines will be built and installed over the next 18 to 24 months for use in manufacturing the new Airbus A350 XWB (Xtra Wide-Body) aircraft.

Airbus, which already has several Flow waterjet systems in production, awarded the entire order to Flow based on the company's long history and demonstrated leadership developing and supporting abrasive waterjet cutting systems for major composites programs.

Airbus will use Flow's CMC waterjet systems throughout all its plants across Europe to cut and trim the wings, fuselage, wing spars, keel beam, and other parts on the A350 XWB, which is Airbus' response to market demand for a medium capacity long range wide-body family. The A350 XWB is an efficient structure because of a design concept that uses more than 60 percent new materials in the aircraft's airframe, all chosen for their superior weight and strength properties. Flow's waterjets lead the industry in cutting these state-of-the-art carbon-fiber materials.

"Waterjets have become the standard for meeting the aerospace industry's production requirements, and Flow is uniquely positioned to serve this segment through our deep experience and innovative technology," says Charley Brown, Flow president and CEO. "We are pleased Airbus selected Flow as the only provider of waterjet Composite Machining Centers and that our technology was chosen over other traditional and non-traditional

machining processes for use on the A350 XWB. Engineering and manufacturing for these products will take place in our recently announced

Advanced Systems Technology and Manufacturing Center which is an expansion of our Jeffersonville, Indiana facility."



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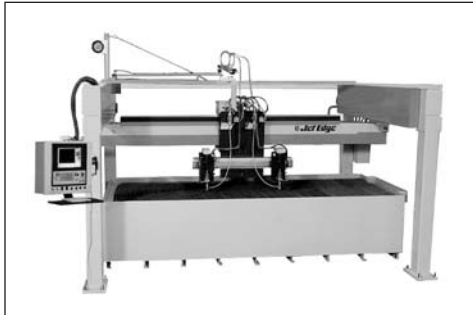
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Jet Edge Exhibiting At IMTS

Jet Edge, Inc. will demonstrate its latest waterjet cutting technologies at the International Manufacturing Technology Show (IMTS), September 8-13, 2008, at McCormick Place in Chicago, Ill.

During IMTS, Jet Edge will showcase its versatile High Rail Gantry precision waterjet cutting system and several new products, including the 90,000psi X-Stream xP90-100 intensifier pump, Contact Height Sensor and Pneumatic Drill. Visitors to Jet Edge Booth B-6252 also will have the opportunity to see Michael Waltrip's Napa 55 Sprint Cup car.



The new X-Stream xP90-100 intensifier pump is capable of producing pressures in excess of 90,000psi. The 100hp X-Stream achieves much faster cutting speeds and drastically lowers operating costs compared to traditional 60,000 psi pumps, enabling users to increase productivity and reduce part costs.

The X-Stream produces 50% more pressure than a 60,000 psi intensifier pump, resulting in a 40-50% increase in productivity for many materials. The X-Stream supports a 75,000 psi continuous operating pressure. Compared to a

60,000 psi pump, typical operating pressures of 75,000 psi use 30% less water, 30% less power, and up to 50% less abrasive, resulting in a 40% reduction in operating costs. They typically reduce taper by up to 0.001". The X-Stream is capable of producing flow rates of 1.45gpm and supports up to a .017" orifice. Its fittings and tubing are rated for 100KSI. The X-Stream is backed by nearly 10 years of extensive research and development in hyper-pressure technology.

With Jet Edge's new Contact Height Sensor, waterjet operators can overcome significant fluctuations in material flatness by maintaining a constant automatic standoff within approximately 0.040" (1 mm) of a set

(continued on page 21)

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New WJTA Decals

New WJTA decals featuring the WJTA logo, email, and website imprinted in red and blue on a white background are now available in three sizes: 3 x 5 inches, 2 x 3.5 inches, and 1 x 2 inches. The larger decals are great for large equipment and machinery. The small decal is ideal for smaller equipment and hardhats.



The self-stick decals are made of sturdy vinyl. Your complimentary supply is enclosed. Additional decals are available for purchase as follows:

Minimum \$5 order.

3 x 5" – 4 for \$5, additional decals 50 cents each

2 x 3.5" – 6 for \$5, additional decals 45 cents each

1 x 2" – 8 for \$5, additional decals 40 cents each

Use the WJTA publications order form enclosed to place your order.

Hughes Pumps' UHP Offshore Unit, Lightweight Jetting Gun

UHP Offshore Unit

With extensive experience in the design and manufacture of high pressure (HP) and ultra high pressure (UHP) plunger pumps and waterjetting equipment since 1970, Hughes Pumps is justifiably proud of its product range and offers a flexible approach to the changing needs of a worldwide customer base.

The range of pumps available from Hughes Pumps are capable of discharge pressures up to 40,000 psi (2750 bar) and flow rates to 205 usgpm (773 lpm), with ratings from 40 to 500 hp (30 to 375 kW).

The offshore oil and gas and marine industries adopted UHP waterjetting as the preferred method of coatings removal/surface preparation some time ago. Until now, some oversized and overpowered units that take up too much deck space and consume too much water were used on the basis that the benefits outweighed the drawbacks.

Hughes Pumps identified the need for a compact, limited power UHP unit, designed specifically for this industry, and the Ultrabar 10EC UHP Offshore Unit was born. With a footprint of 71 inches long x 39 inches wide (1.8m long x 1.0m wide), developing 2.3 usgpm at 30,500 psi (8.6 lpm at 2100 bar), mounted in a fully certified, compact offshore crashframe and fitted with a 50 hp (37kW) Zone 1 or 2 electric motor suitable for use from a 63 amp socket. This unit has been subjected to extensive trials in the North Sea, UK on various gas platforms and on a variety of riding crew projects (work carried out by operators on a ship while at sea) over the last year and has been extremely well received.



Ideal for spot blasting and general surface preparation, this unit is probably the most compact and user-friendly UHP unit available on the market.

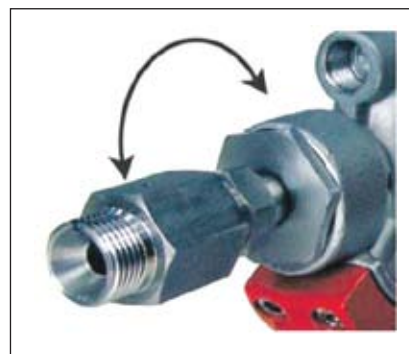
Lightweight Jetting Gun

Getting the best out of any high or ultra high pressure pump set requires the use of the correct accessories – and with almost 40 years of experience in the industry, UK manufacturer Hughes

Pumps Ltd. should know.

Hughes Pumps have within their range of accessories one of the most user-friendly waterjetting guns on the market. With a weight of only 6.6 lbs. (3.0 kgs), this is possibly the lightest gun currently available. But that's not all – the integrated hose swivel gives the user freedom of movement by preventing hose twist and allows the gun to be controlled very easily, and the shoulder stock will help reduce fatigue. A cartridge type repair kit makes changing the wear components very easy. All of this allows operators to work continuously for longer periods of time. Dump and dry-shut type guns are available in 15,000 and 20,000 psi (1000 and 1400 bar) versions.

For more information on the Ultrabar 10EC UHP Offshore Unit, Lightweight Jetting Gun, or other Hughes Pumps products visit www.hughes-pumps.co.uk or email sales@hughes-pumps.co.uk.



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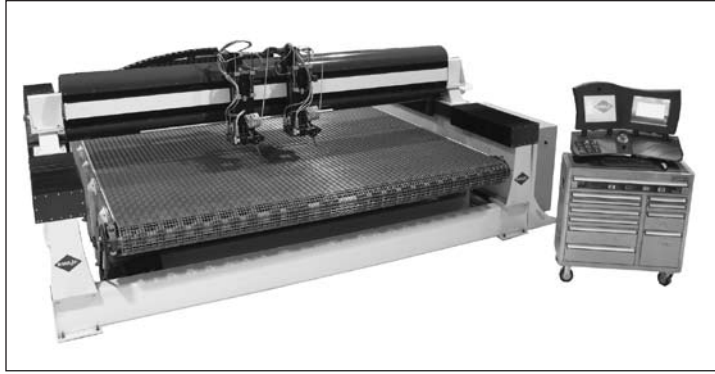
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WARDJet Introduces New Waterjet Systems, Accessories

WARDJet, Inc. a leading manufacturer of waterjet cutting machines, now offers over 20 models for customers to choose from. WARDJet

produces systems with multiple 5 axis abrasive or water only cutting heads. WARDJet also specializes in custom machine applications with a huge selection of options that can be mounted on the units such as height sensors, crash sensors, laser alignment, drill and tapping units so you can cut a hole and



tap it all in one program and countless more practical processes to suit the customers' needs.

Customers are most interested in the almost unlimited capability of the double screen controller with built-in camera. The controller monitors consumable use, service

and maintenance and is pro-active in notifying customers, offers full remote control from another location (possibly your cell phone) and emails the status of the work performed and outstanding to management. The capability of the controller is so advanced over anything that has ever been seen, the only way to truly appreciate its capabilities is to play with one.

WARDJet will have several X-Series waterjet controllers at the FABTECH International & AWS Welding Show. Visit booth #4263 to experience firsthand the advantages of partnering with WARDJet. For more information, call 330-677-9100; email: sales@wardjet.com; or visit www.wardjet.com.

Keeping Fuel Costs Down, from page 4

horsepower engine and you'll be running at 1,600 rpm but using 14.7 gallons of diesel per hour."

That is a difference of 6.5 gallons per hour. At the June 30 price of diesel, that comes to just over \$30 per hour in fuel savings. "You're better off running a small machine wide open then a big machine slow because you'll burn less fuel," said Lobusch.

Lobusch added that contractors should also make sure their operators know how to calculate the amount of water needed for a job and run only at those rates. "It won't save as much fuel as picking the right machine, but it will help," he said.

VACUUM TRUCKS - BACK TO BASICS

According to Tony Fuller, sales director for Federal Signal's Environmental Solutions Group, the

single most important thing operators can do to maximize vacuum truck fuel economy is to set up the job to minimize friction.

"Friction creates restriction," said Fuller. "It reduces air flow, so the truck has to work harder and use more fuel to move material. Anything you can do to reduce friction on the job will improve fuel economy."

This has always been the best and most economical way to operate a vacuum truck. It not only improves efficiency and fuel economy, but also ensures your rig keeps its peak performance for years to come. With fuel prices so high, it will pay you back to remain disciplined. To really stretch those fuel dollars, Fuller offered the following suggestions:

Get closer. Position the truck as close to the job as possible. The shorter the hose, the less friction generated by material moving through it.

Pick the right hose size. "Start with the right sized hose and stay with it," said Fuller. "The best hose is usually the largest hose you can use on a job. Vacuum trucks use vacuum to lift material, but they use air to move it. The wider the hose opening, the more air that can flow through it and carry the material quickly back to the truck. Best of all, you can do it at fuel-saving low rpms."

Smaller hoses allow far less air flow. A 6-inch hose has half and a 4-inch hose has one-quarter the air flow of an 8-inch hose. That means that trucks connected to smaller hoses must work harder to achieve the same lifting capacity. Small hoses also produce more friction during vacuuming and are more prone to clogging.

Use only one size hose. Attaching a 6-inch hose to an 8-inch hose to a 6-inch hose changes the air velocity

(continued on page 22)

New Rotating Nozzle Removes Pipe Build-up In One Pass

Large blocked pipes (up to 12 inches in diameter, or 30.5 cm) can typically be cleared in a single pass with the RPN2420, a new rotating water jet nozzle from NLB Corp. It has five high-cohesive nozzles rotating at up to 500 rpm to maximize the powerful force of 20,000 psi water jets. The self-propelling nozzle easily clears blockages horizontally, vertically and in tight elbows.



The NLB RPN2420 makes pipe cleaning more productive and is field-repairable with a simple kit. Rotation is variable from 50 rpm to 500 rpm, with full speed control. The new nozzle operates at pressures up to 20,000 psi (1,400 bar) with flow up to 20 gpm (76 lpm). It features five sapphire nozzles positioned for peak efficiency, one in front and four on the sides. The body is precision-machined of stainless steel for long life, and weighs just 3 lbs. (1.35 kg).

NLB also offers a higher-flow rotating nozzle for pipes with diameters of up to 72 inches (183 cm). The RPN2460 operates at a flow of up to 60 gpm (227 lpm) and pressure of up to 20,000 psi (1,400 bar).

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

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KMT Waterjet Systems Appoints Bryon Machado New South Area Manager

To help support waterjet users with high pressure system questions and to spread information about our organization and its new line of pump and cutting head products, KMT Waterjet Systems has appointed Bryon Machado as the Area Manager in the South Region including Kansas, Oklahoma, Texas, Louisiana, New Mexico, Colorado, Utah, Arizona, and Wyoming. Bryon will spend the majority of his time traveling in the area working directly with customers.

Before accepting this position, Bryon worked for three years at the KMT Waterjet headquarters in new application development and inside sales support. Bryon will be based out of the world headquarters located in Baxter Springs, KS. He has already been calling on and helping customers learn about new pumps, products and services available, as well as helping customers with system performance issues.

Bryon graduated from Oklahoma State University in 2005 with a BS in Business Administration and is certified through the KMT Technical Service program. Bryon can be reached by calling his direct line at 620-856-6234 or by e-mail at bryon.machado@kmtgroup.com.

Gardner Denver Appoints Greg Laux New Area Sales Manager

Gardner Denver Water Jetting Systems has announced the appointment of Gregory Laux to the position of Area Sales Manager. Laux will be responsible for Gardner Denver Water Jetting Systems sales activity in the East Coast and Midwest United States and the Eastern Provinces of Canada.



Gregory Laux

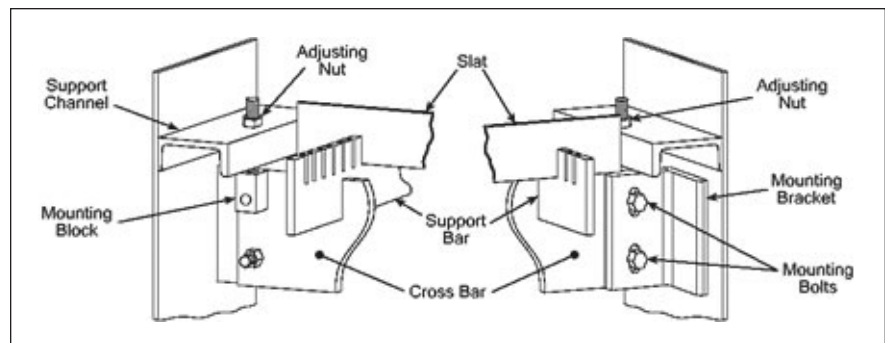
Laux brings over 25 years of experience selling and servicing high and ultra high pressure waterjet systems in the United States and Canada.

A graduate of the University of Houston, Laux has accepted the responsibility for distributor and direct sales in his assigned territory.

For more information about Gardner Denver Water Jetting Systems, visit www.waterjetting.com or call 281-448-5800.

Adjustable Slat Kit For High Rail Gantry Waterjet System

Jet Edge, Inc., has introduced a new Adjustable Slat Kit for its High Rail Gantry waterjet cutting system. Now standard on all Jet Edge waterjet catcher tanks 9 feet wide and larger, the Adjustable Slat Kit allows the waterjet work surface to be leveled independently of the catcher tank. The Adjustable Slat Kit provides 1 inch of adjustment and can be adjusted with a wrench; this significantly decreases installation time and enables waterjet operators to easily replace slats and level their work surfaces themselves.



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

Jet Edge Exhibiting At IMTS, from page 15

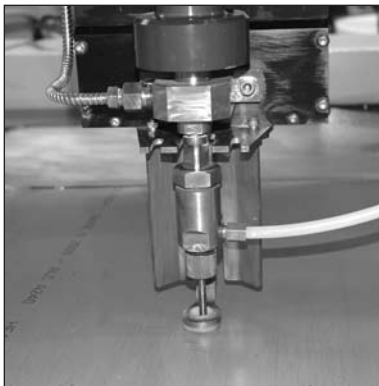
standoff height. As a result, they will achieve optimum cut quality, tolerance, taper and speed without having to monitor the standoff.

The Contact Height Sensor senses directly around the nozzle so the information is as close as possible to the nozzle location. The sensor arm can either ride on the plate or have infinite programming for the time it is in contact and raised. This gives operators complete control over how they want the height sensing to work for their application.

Jet Edge's AquaVision Di controller software also provides feature avoidance for the Contact Height Sensor. This protects the height sensor and cutting head by automatically providing a tool path that will not allow the cutting head to pass over a previously cut part, which can tip up after being cut. The software can be configured to allow up to four heads with height sensing to be controlled independently.

The Contact Height Sensor is compatible with Jet Edge's Permalin abrasivejet cutting head.

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






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Keeping Fuel Costs Down, from page 18

where the two hoses meet (since the same amount of air now has to flow across half the area). This becomes a spot where material builds up and starts clogging the hose. Clogging cuts efficiency, burns fuel, and loses you whatever time and money you thought you'd save by not switching out the entire hose.

Straighten up. "I once got a call from an operator cleaning a 120-foot-high hydrocracker," recalled Fuller. "He had 50 feet of hose coiled at the top of the unit that he planned to run into the hydrocracker as he cleaned it out. His truck was running wide open and barely anything was coming out."

The problem, said Fuller, was the 50 feet of coiled hose. Coiling creates lots of friction, and 50 feet of it created blockages too. After straightening out the hose, the contractor was able to load about 1 barrel per minute – while running at lower rpms and using less fuel.

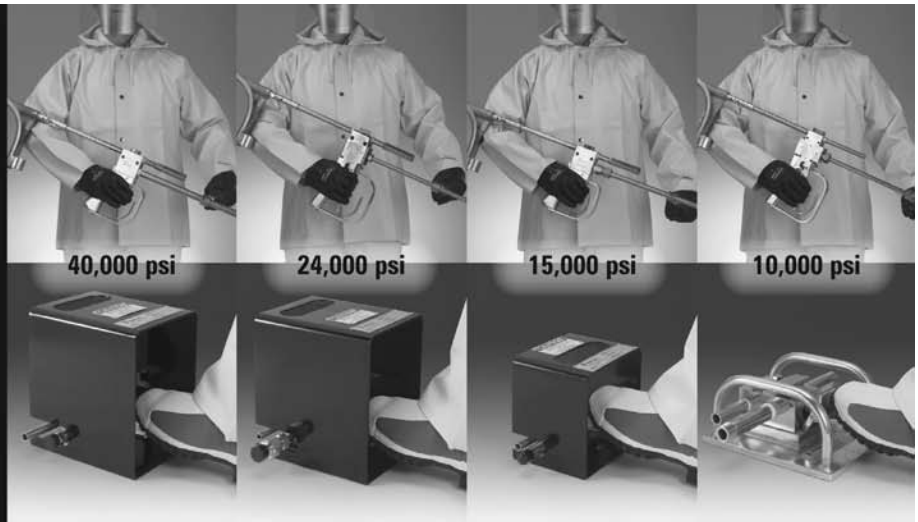
Use a nozzle. "Working without a nozzle wears workers out," said Fuller. "They need to stop and take rests frequently, and all the time the truck is burning diesel." A good nozzle is easier on workers so they won't need as many breaks."

Check seals. Gasket leaks kill vacuums because the truck sucks in air through the leak rather than the hose. That means you have to run at higher rpms to maintain the air flow you want. The solution is simple: check and clean gaskets regularly to make sure they seal properly. Also check gaskets on hose couplings and relief valves. If you find a problem, fix it quickly. Duct tape may work for a day or two, but eventually it will start leaking. Better to keep some spares in the shop and operate at peak efficiency.

Keep air path clean and flowing. Inspect the paths between the tank, cyclone, and baghouse. Clean out any blockages, and don't let material start to accumulate because they will lead to blockages. Wash the areas between jobs.

Check your filter bags. Make sure your filter bags have no holes. The filters protect the blower from material. If they have holes, the baghouse will pass that material to the blower, and it will act like sand

(continued on page 23)



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blasting to erode the lobes. Once that starts happening, your truck has to work harder and harder (and burn more fuel) to maintain a vacuum. Also, keep the bags clean to minimize restrictions. You can clean them by running the pulsation system when going to the dump.

Slow down. “Our natural instinct is to operate a truck full out, but that’s like trying to get through city traffic by driving with the accelerator on the floor,” said Fuller. “Especially if you have a light material and a short distance, run at lower rpms. Otherwise, the air flow will be so high, it will pull the material right into the baghouse instead of letting it settle in the tank.”

No doubt about it, running vacuum trucks and waterjets will burn fuel. But if operators stick with the basics, they may be able to cut fuel consumption significantly and remain competitive in tough times.

Jetstream of Houston, LLP, a division of Federal Signal Corporation’s (NYSE:FSS) Environmental Solutions Group, manufactures industrial high-pressure waterblasting equipment operated at pressures up to 40,000 psi for a wide range of applications, including industrial cleaning and surface preparation. Product offerings include a complete line of skid- and trailer-mounted pump units, control guns, valves, hoses, replacement parts and

nozzles. For more information, visit www.waterblast.com.

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Owning Versus Renting Equipment, from page 11

Renting gives contractors access to very specialized equipment that may only be needed for one job or even one day.

Large projects some times require additional equipment that cannot be purchased rapidly. Often times when a contract is let, contractors must have large amounts of equipment on hand in a short amount of time. Renting allows contractors to have equipment on the job in short order. In our industry much of the equipment is built to order. Sometimes it can be weeks or even months before a new piece of equipment can be delivered.

Industry has changed in the way contracts are being handled. Gone are the days of the exclusive multi-year contracts. Now, more and

more contracts are short term and contractors are under more scrutiny. Renting can be very helpful when negotiating the uncertainty of these current market trends.

Most contractors have certain core businesses. During these operations ancillary projects often arise and renting gives contractors access to these projects. Many times these projects enable the contractor to further expand their core businesses.

Unfortunately, equipment breaks down and never at a good time. When equipment failures do occur owners need a replacement quickly. Renting can be the difference between staying on the job or being replaced by another contractor.

To close, if owners have long term commitments with high utilization equipment ownership makes sense. On the other hand, many contractors are finding that renting can be a key component in their business strategy, enabling them to grow in an ever-changing marketplace.

For more information, visit www.vactruckrental.com.

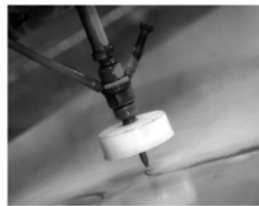
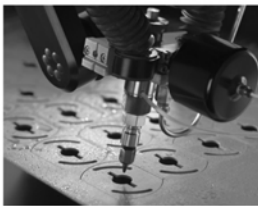
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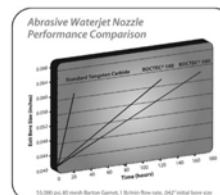
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- **Safe Operation of Industrial Vacuum Equipment Seminar.**
- **Waterjet Boot Camp**—Industry experts offer information and suggestions on ways to help contractors buy smart, improve efficiency and generate profitable new business. Sessions are presented in the exhibit hall so participants can alternate between viewing exhibits and catching sessions of interest.
- **Waterjet Technology: Basics and Beyond Pre-Conference Workshop**—Start with the basics and follow up with an in depth look at these waterjet applications: Surface Preparation, Cleaning Applications, and Cutting Applications.
- **Emerging Technology, New Applications**—Hear some of the world's foremost engineers and researchers share new developments in applications, mechanics, equipment, and procedures.



The **WJTA Conference and Expo** is unique in that the program is dedicated to high pressure waterjet technology and related industries. If you are involved in high pressure waterjetting for cleaning, surface preparation, industrial vacuuming/air moving for industrial cleanup/recovery, waterblasting or cutting, or if you are interested in finding out more about the industry, the **WJTA Conference and Expo** is an ideal resource for information and an excellent meeting for networking with other professionals in the field.



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and Expo activities. The Marriott is a **smoke-free** facility. For reservations, call toll-free **800-452-5110** or contact the Marriott directly at **713-978-7400**. Be sure to identify yourself as attending the WaterJet Technology Association Conference to receive the special group rates of **\$149 single/double occupancy. August 2, 2009**, is the deadline for guaranteed room availability. Reservations received after **August 2, 2009**, will be confirmed on a space available basis. Rooms may still be available after August 2, but not necessarily at the rates listed above.



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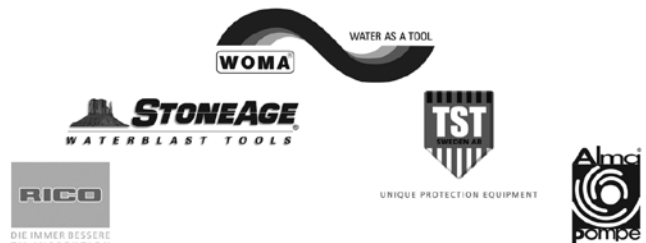
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Keys To High-Pressure Hose Safety, from page 8

kinks and crushed areas along the length of the flex lance. Inspect the fitting for damage. It may be oval from improper assembly or because the waterjet has begun to wear away the fitting.

Check for stiff sections along the length of the hose. This indicates the area is corroded and the hose must be discarded at once. Check the age of the hose assembly. If its age cannot be determined it is safer to not use the flex lance than to risk possible failure.

Conclusion

Since the initial development of high-pressure hose, many technical advancements have been made. The core tube materials are much tougher, and have improved fatigue resistance, and new manufacturing methods produce tube of consistent quality.

The quality and tenacity of the pressure-carrying reinforcement has improved dramatically. This makes for a longer service life and higher rated burst strength. Hose fittings have been engineered to avoid leakage, thereby increasing service life.

Given these advancements, the end user can expect the same level of performance from each and every hose assembly. Outer covers are tougher and offer greater abrasion resistance and may be extra thick, which may eliminate the need for abrasion shields. These special covers are becoming standard on many of the large bore hoses and have multi-layer covers of different colors. If the outer cover is worn down to the sub layer, then the color change is evident and added protection or hose replacement can be addressed.

Further study in chemical attack is planned, as are lighter safety

shields. Manufacturers are investing in research and development to increase flow and pressure ratings in larger hose types, which are used as supply hoses. Ongoing technical improvements include chemical compatibility, weight-reducing polymers, increased hose flexibility and higher working pressures.

Finally, safety is of utmost concern and manufacturers are actively

improving and developing new accessories that will protect the operator and offer a safe product that can be used with the highest confidence.

For more information about Parker Polyflex, call (281) 530-5300 or visit www.parker.com.

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AccuStream's New Intensifier Pump

AccuStream has introduced a new 150 horsepower model to its AS Series of intensifier pumps. The AS-60150 produces 3.2 gpm (12.1 lpm) continuous output pressure adjustable up to 60,000 psi. The pump incorporates Accustream's innovative *Advanced Intensifier Technology* (AIT™). Over the past few years, the AIT intensifiers have been the top performing intensifiers in the waterjet market. The combination of intelligent design, quality manufacturing and carefully selected material has provided users the greatest periods between maintenance intervals. The machine features two independent hydraulic pumps which power each intensifier. Each hydraulic pump can be isolated, allowing maintenance on one intensifier while operating the other. The ergonomic frame design improves the ease-of-use and effectiveness of the key components and maintenance items.

The Accustream control center features proprietary software that



uses an easy-to-understand format with a touch screen panel, to guide operators through a series of steps necessary to operate, troubleshoot and log maintenance. The control center can be loaded with up to four different languages.

Other features include a leak-before-fail 2-liter attenuator, a new improved safety dump valve, electronic pressure control, insulated covers and a remote control of all pumps operations.

For more information on the AS-60150 or other innovative waterjet products, visit www.accustream.com or contact an Accustream representative at (651) 294-8600.

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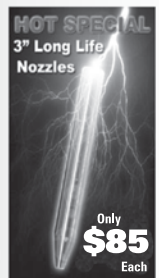


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