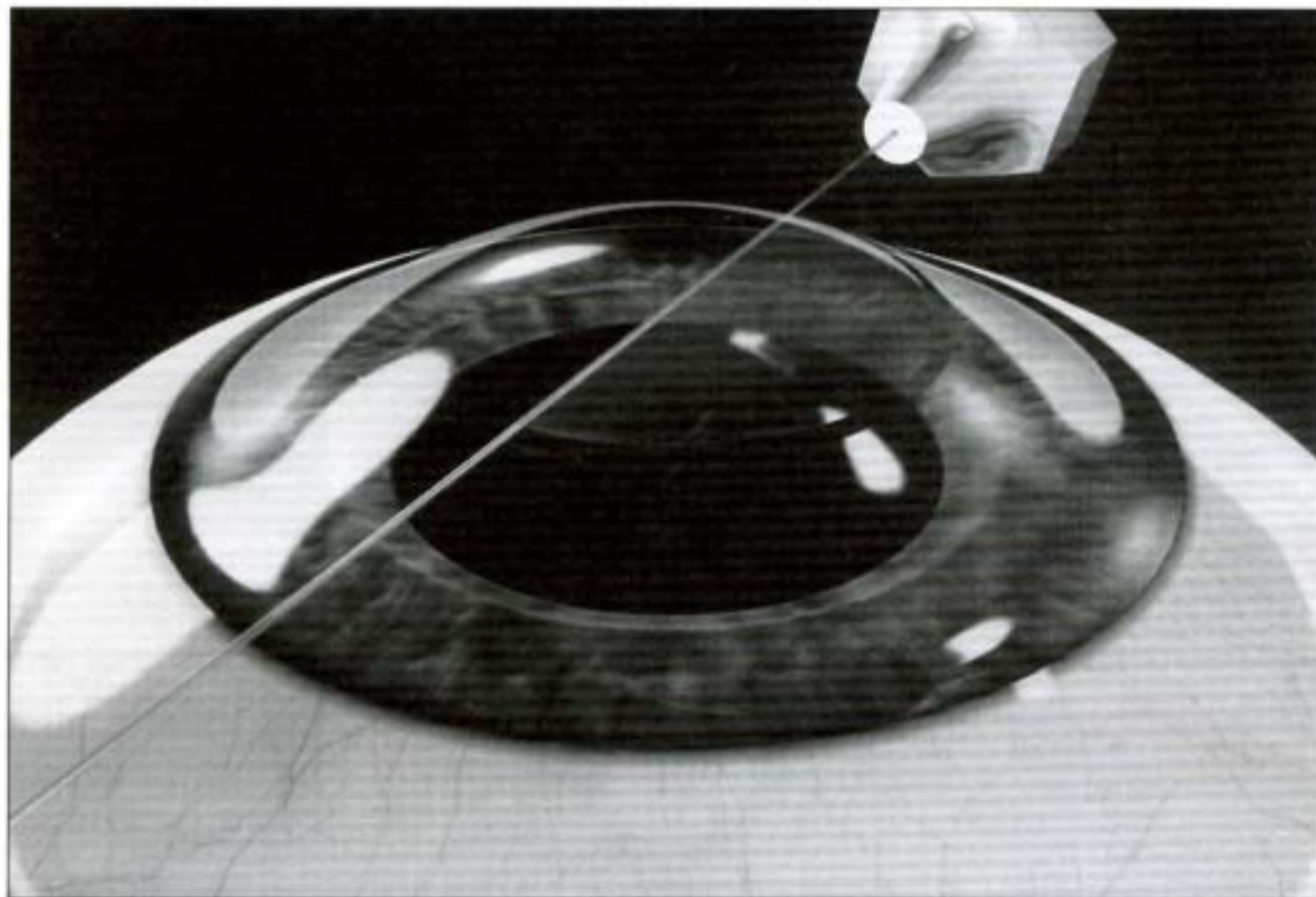




## Waterjets Used In Eye Surgery



**M**edjet Inc. of Edison, New Jersey has developed a device which uses a waterjet to do eye surgery. In this device a conventional surgical blade is replaced by a small diameter ( $33\mu\text{m}$ ), high speed jet of sterile saline solution. This new HydraBlade™ Keratome is intended to be used for cutting without erosion in corneal surgery, particularly "damage free" removal of shaped or parallel discs such as for therapeutic surgery, corneal lamellar transplants, producing parallel hinged flaps, refractive surgery, and the precise removal of epithelium (the anterior surface of the cornea) by erosion without damage to the underlying Bowman's layer.

The waterjet beam diameter ranges from  $10\mu\text{m}$  to  $100\mu\text{m}$  depending on the application. For lamellar surgery the stagnation pressure is 20,000 psi and the beam diameter is  $33\mu\text{m}$ . The measured flow rate of the beam is about 0.367 milliliters per second and the maximum beam speed at the beam center is 460 meters per second. The beam scans at 10 millimeters per second. The time to cut is about 0.8 seconds and the saline usage is about 0.3 milliliters.

The HydraBlade Keratome was described in a paper by E.I. Gordon and P. Turdiu at the Ninth American Waterjet Conference in Dearborn, Michigan, August 23-26, 1997.

# David Summers Receives 1997 Pioneer Award

The Waterjet Technology Association's (WJTA's) highest award, the Pioneer Award, was bestowed August 24, 1997, on Dr. David Summers during an awards luncheon at the 9th American Waterjet Conference in Dearborn, Michigan, in recognition of his significant contributions toward the advancement of fluid jet technology.



David Summers, Ph.D. (left) and Forrest Shook.

Dr. Summers was a driving force in the formation of the WJTA. He has been actively advancing the state-of-the-art of waterjet technology for more than 25 years. As a Curators' Professor at the University Of Missouri-Rolla (UMR) and a director of both the High Pressure Waterjet Laboratory and the Rock Mechanics and Explosives Research Center at UMR, Dr. Summers continues to be a world renowned authority on waterjet applications. He "preaches the gospel" of waterjet-related solutions to a variety of problems in industry

and continually widens the field of applicability of high pressure waterjets. His laboratory has produced many well qualified graduates who work in the U.S. waterjetting industry.

Dr. Summers is a leading advocate of the safe use of waterjets and for several years served as the chairman of the WJTA Safety Committee. Dr. Summers was the prime mover in the development of the WJTA's *Recommended Practices For The Use Of Manually Operated High Pressure Waterjetting Equipment*, and in 1993 he received the WJTA Safety Award in recognition of his contributions to waterjetting safety. Dr. Summers continues to be an active member of the committee which reviews and updates *Recommended Practices*.

Dr. Summers received his doctoral degree in mining engineering from the University of Leeds, England in 1968. He then joined the staff of UMR as an assistant professor of mining engineering and senior research investigator at UMR's Rock Mechanics and Explosives Research Center.



Four Pioneer Award winners were present at the 9th American Waterjet Conference. They are (l. to r.) William Cooley, Ph.D. of Fairfax, Virginia; Norman Franz, Ph.D. of Vancouver, British Columbia; John Olson, Ph.D. of Auburn, Washington; and David Summers, Ph.D. of Rolla, Missouri.

Dr. Summers has served on the WJTA Board of Directors since 1983 and has held the offices of president, vice president, and chairman of the board of directors. He has also served as vice president of the International Society of Waterjet Technology and the chairman of several of the Society of Manufacturing Engineers' clinics in industrial waterjet cutting.

Dr. Summers resides in Rolla, Missouri, with his wife Barbara and sons Daniel and Joseph.

## WJTA Administration

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**President/Jet News Editor**  
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Lydia M. Frenz, Ph.D. (209)267-0992	Mohan Vijay, Ph.D. (613)993-2731
Dr. Mohamed Hashish (206)850-3500	

### Emeritus Members

Thomas J. Labus (414)275-5572	Fun-Den Wang, Ph.D. (303)273-3653
----------------------------------	--------------------------------------

### Association Managers

Mark S. Birenbaum, Ph.D. Kenneth C. Carroll (314)241-1445
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## LAI East Doubles Size Of Its Plant

**L**aser Applications, Inc. (LAI), the nation's largest provider of laser and waterjet processing services, announced it will expand its manufacturing plant in Westminster, Maryland.

The LAI East facility, which opened in 1984, will double in size to 40,000 square feet. This will permit the company to add a four-by-twelve foot abrasive waterjet workstation and two industrial lasers by the end of September.

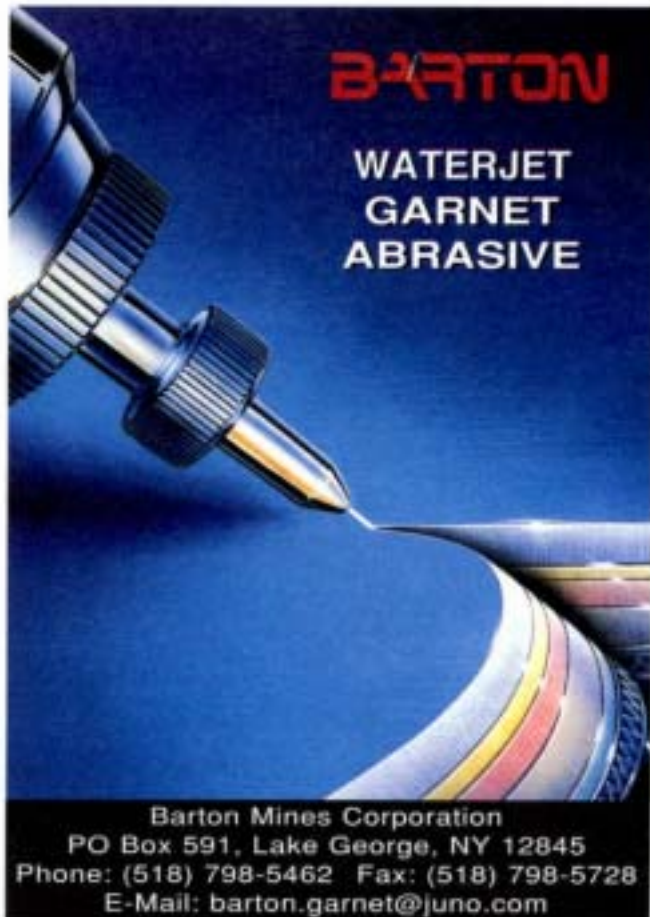
The increased production and office space will help streamline manufacturing and customer service operations, said George Tillman, chief executive officer of LAI East.

"The equipment we have will be relocated to permit a more efficient workflow through our manufacturing processes," Tillman said.

LAI East plans to fully use the new manufacturing area by next February.

Building improvement projects now underway include increasing cooling capacity for the lasers, installing additional electrical service, expanding exhaust capabilities and upgrading material handling systems. The tooling shop and maintenance space will grow into larger work areas. LAI also plans to renovate and enlarge administrative and sales offices.

LAI — with 14 laser and 16 waterjet stations — provides job-shop manufacturing services for aerospace, automotive, nuclear, medical and heavy manufacturing industries. The company, which also operates plants in Minneapolis, Minnesota, and Phoenix, Arizona, runs state-of-the-art process control systems for high definition waterjet cutting and drilling. It is also an industry leader in laser cutting, welding, marking and heat-treating. LAI can process any material, including titanium, steel, plastics and composites.



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## Possis Medical, Inc. Seeks To Broaden AngioJet® System Label Claims

**P**ossis Medical, Inc. (NASDAQ: POSS) of Minneapolis, MN, has submitted a 510(k) application to the U. S. Food and Drug Administration (FDA) seeking clearance to expand label claims for its AngioJet® Rapid Thrombectomy System to include use in peripheral arteries and bypass grafts. A description of this system was included in the August 1997 issue of *Jet News*.\*

The submission includes combined U.S. and multicenter German results on AngioJet System clinical performance in leg arteries and bypass grafts, and also refers to results from a completed dialysis access study and an ongoing coronary study. In December 1996 the Company received its initial FDA clearance to market the AngioJet

System for use to remove blood clots from dialysis access grafts.

"Our strategy is to establish the broad clinical utility of the AngioJet System through appropriate clinical trials in support of FDA clearances for expanding product marketing," said Robert Dutcher, president and CEO. "We believe what makes our technology unique is that the AngioJet System is designed to remove blood clots from vessels throughout the body and therefore has potential to treat a wide range of serious medical conditions such as dialysis access graft failure, leg pain, heart attack and stroke. We anticipate a response to this latest FDA submission by mid-October."

Possis Medical, Inc. develops, manufactures and markets pioneering medical devices for the growing cardiovascular and vascular treatment markets. Its AngioJet Rapid Thrombectomy System is marketed in the United States for treatment of dialysis access graft thrombosis. Its three products — the AngioJet® Rapid Thrombectomy System, the Perma-Flow® Coronary Bypass Graft and the Perma-Seal® Dialysis Access Graft — are highly differentiated, next-generation medical devices that have the potential to become preferred treatment options.

\*The editor regrets that in the August *Jet News* article on Possis Medical ("Waterjets Open Clogged Blood Vessels"), the flow rate of the jet pump was stated as 50cc. It should have been stated as 50cc per minute.

## Ninth American Waterjet Conference A Success

The 9th American Waterjet Conference was held August 23-36, 1997, at the Hyatt Regency Hotel in Dearborn, Michigan. Engineers, scientists, educators, contractors, manufacturers and suppliers (598 in all) gathered to see the latest advances in waterjetting technology and to witness live field demonstrations of a variety of fluid jet equipment. Registrants came from all over the United States and from 22 other nations.

The Conference began Saturday, August 23, with a day-long short course on the basic techniques and applications of fluid jet technology. Each participant received the textbook, *Fluid Jet Technology — Fundamentals And Applications*.

Concurrent sessions dealing with fluid jet research and the application of fluid jet technology were held on August 24 and 25. A total of 62 papers were presented in these sessions. These papers are published in the *Proceedings Of The 9th American Waterjet Conference*.

The newest in waterjetting equipment, supplies and services were on display by 41 companies in the exhibition hall. The exhibition opened on August 23 with a welcoming reception amidst the displays.

On Tuesday, August 26, the conference concluded with equipment demonstrations by Aqua-Dyne Inc., Flow International Corporation, Jet Edge Inc., Jotech and National Liquid Blasting (NLB) Corporation.

Related Conference news and photographs can be found throughout this issue of *Jet News*.

## WJTA 1997 Awards



Service Award: Recipient Andrew F. Conn, Ph.D. (right) and George A. Savanick, Ph.D.



Technology Award: From left, recipient Hartmut Louis, Dr. Ing.; Mohamed Hashish, Ph.D., and Thomas Kim, Ph.D.

Retiring Board Member: From right, recipient Thomas Labus; Forrest Shook; and George A. Savanick, Ph.D.



## The WJTA Party features dinner, Karaoke, games of chance and prizes.



Members of the Waterjetters' Chorus Line try Karaoke.



From left, Alan Bennett, Forest Shook and Stefano Dal Lago place funny-money bets on a horserace.



A sampling of the WJTA party gifts provided courtesy of High Pressure Equipment Co., Erie, Pennsylvania.



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## Thar She Blows — A Whale Of A Jet



**W**hen a whale surfaces to breathe in, it must first breathe out. The "blow" or "spout" is the name given to the jet of moist vapor blown out of the whale's lungs. The blow of the largest whale can reach 26

feet (18 meters) in height. This figure shows a blow from a right whale. Blows from right whales are from 6 to 10 feet (2-3 meters) in height.

Photo courtesy of the New England Aquarium  
© 1992. Photo taken by Kenneth Malloy.

### Upcoming Events

#### 1997

**October 18-20:** PWNA Technical Seminar, Dallas, Texas. Call toll-free 1-800-393-7962.

**December 3-6:** CORCON '97 International Conference & Exhibition On Corrosion, Nehru Center, Mumbai, India. Contact Rajan Bahri, Chairman - Organizing Committee, 386, Veer Savarkar Marg, Mumbai - 400 025, India, phone: 0091-22-4307023, 4228042, fax: 0091-22-4307365, e-mail: ashok@soochak.nest.ernet.in.

#### 1998

**February 3-5:** 5th Pacific Rim International Conference on Waterjet Technology, Ashok Hotel, New Delhi, India. Contact Dr. Mohan M. Vijay, phone (613)993-2731, fax: (613)952-1395, e-mail: mohan.vijay@nrc.ca.

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<http://www.nlbcorp.com>

\*WJ-1 is an international surface standard, ref. NACE No. 5/SSPC-SP 12.

# Conjet Launches New Hydrodemolition Machines

**C**onjet AB of Sweden has added two further hydrodemolition machines to its comprehensive range of high pressure waterjetting equipment for selectively removing steel reinforced concrete, weakened and damaged by salt and frost from numerous structures. These structures include bridge decks, joints, soffits, pillars and columns, harbor and dock walls, dam faces, tunnel and hydro-electric turbine linings, car parking decks and airport runways.

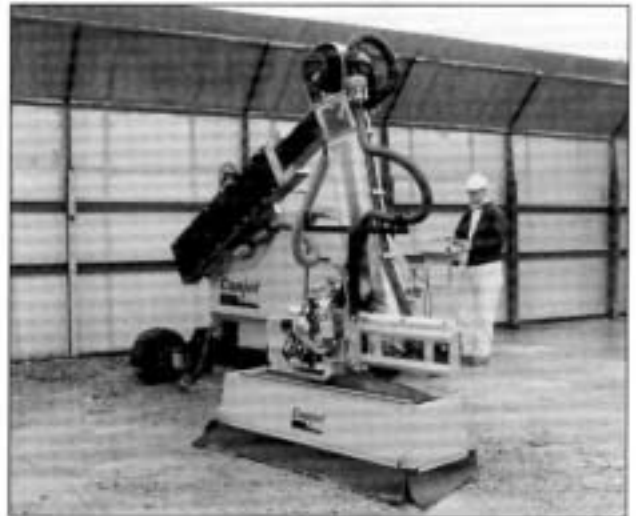
The Swedish company's latest top of the range, self contained Conjet Robot 362 and versatile Jetframe 102, with its separate CCU 156 power pack, are both equipped with the very latest computerized closed loop control, monitoring and display system.

The Conjet Robot 362 is a compact, exceptionally maneuverable, self contained, three wheeled hydrostatically driven carrier supporting and directing a special high pressure waterjetting nozzle. The nozzle is connected to an oscillating cassette running back and forth along a feed beam, which is attached by a rotating joint to a rigid arm. The arm is mounted on a 360° rotating turntable on the front

of the base carrier to provide a reach of 3.5 meters.

An optional articulating, multi-positioning boom with an extra rotating joint, is available to increase reach to over 6 meters. This additional versatile combination gives the operator considerable flexibility to use the Conjet Robot on a wide variety of hydrodemolition tasks, including reaching under a bridge deck soffit while the machine stays on the deck above.

The Conjet Robot 362 is complemented by the Conjet Jetframe 102 system for use in confined spaces and on surfaces inaccessible to standard Conjet Robot waterjetting equipment. The lightweight Jetframe 102 can be fixed to any concrete surface being repaired, such as the face of a dam, dock or harbor wall, or mounted on scaffolding or access platform.



The new compact and versatile Conjet Robot 362 hydrodemolition machine with articulating, multi-positioning arm can selectively remove damaged concrete from numerous structures.

Both Conjet machines are controlled by a new and advanced microprocessor closed loop control system, which is extremely flexible and very easy for the operator to use and optimize production. The system displays and stores all the relevant parameters and machine performance data, which can be printed or downloaded to a PC for reference or used in estimating future hydrodemolition projects.

The Conjet operator selects one of nine pre-loaded software programs, which have adjustable parameters to ensure that only concrete to a pre-determined quality depth is selectively removed in a continuous, uniform and safe operation. Operators can also easily set the Conjet computer to memorize and store data from projects for future use on one of 11 additional programs and program the computer on site to match a specific operation. The latest Conjet hydrodemolition equipment can also be pre-set to make two cuts at two different levels on the same cutting stroke.

(continued on page 9)



The new compact and lightweight Conjet Jetframe 102 system selectively removes damaged concrete in confined spaces and on surfaces inaccessible to standard Conjet hydrodemolition equipment.



## Vulcan Waterjet Sets Sails For Fundraiser

Vulcan Waterjet Cutting Services of Milwaukee, Wisconsin, recently fabricated 21 unique wrought iron deck chairs with custom designed sailboats inset into the chair backs. The project was a fundraiser for the newly rebuilt Oconomowoc Lake Club, Oconomowoc, Wisconsin.

Members of the club "purchased" the chairs by making a donation toward the costs of rebuilding and furnishing the facility, which had burned several years ago. In recognition of the members' contributions, the individually made chairs each feature a sailboat bearing an "O" for the club, and the sail number of the member who donated it. One racing crew donated four chairs, and all four carry their specific boat's sail number. The distinctive deck chairs now serve as a constant reminder of the team effort that revitalized the Oconomowoc Lake Club.



Special attention to the visual details of the sailboats created high demand among the club's sailors. Each is complete with rigging, rudder, keel, viewing window, and even the battens that keep the sail edge straight. Of course, the most distinctive feature of each individual sailboat chair is the special number at the top of the sail. True to traditional inland lake sailing

practices, every sailboat has a unique sail number that identifies it.

Vulcan Waterjet initiated the chair project by scanning a drawing of a sailboat, then utilized their CAD system, and added clouds as embellishment. The drawing was then digitized to program the waterjet's robotic cutting head.

Vulcan Waterjet Cutting Services and parent company Vulcan Lead Products combined forces to complete the custom chairs. The heavy wrought iron deck chairs were modified by removing the chair backs, grinding and smoothing all edges, inserting the uniquely numbered sailboats, sandblasting, and finally powder coating them.

For more information about Vulcan Waterjet Cutting Services, call 414-645-2040 or 800-932-5323 or e-mail [vwaterjet@aol.com](mailto:vwaterjet@aol.com).



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## Waterjets On Irrigation Systems

Irrigation systems using waterjets are a common sight in the midwestern United States. Typically these operate on a center pivot and irrigate a large circular area. The large circles of green are striking when viewed from an airplane.

Shown below is a Reinke Manufacturing Company Inc. irrigation system. This system is located on the Bob and Ron Friehe farm located



southeast of McCook, Nebraska. Reinke Irrigation Systems use a series of vertical sprinklers placed along the length of the mainline pipe. Depending on the type of sprinkler they operate from 6 to 50 feet and provide a wetted diameter of 34 to 84 feet.

The end gun on the system shown operates at approximately 65 psi and 45 gallons per minute and covers and



extends the coverage of the system an additional 80 to 130 feet.

More information is available from Reinke Manufacturing Co., Inc., 101 Reinke Road, P. O. Box 566, ~~Nebraska~~ NE 68340 USA.

*Deshler*

## Conjet Launches New Hydrodemolition Machines, from pg. 7

Each machine's computer controlled operational parameters are constantly displayed on a screen on the operator's control panel. The display includes the oscillating and traversing speed of the nozzle's supporting cradle, the angle of the special jetting nozzle, and the cutting width and production rate in meter<sup>2</sup>/hour. A constant monitoring system provides the operator with a visual alarm display if the Conjet hydrodemolition equipment deviates from its pre-set sequence. The control system also incorporates self diagnostics and provides the operator with a visual alarm and display of any machine faults, which, if serious, will trigger the computer to automatically shut the equipment down.

Safety is paramount with Conjet equipment and all functions are controlled from a hand portable, remote control console ensuring safe operation for the Conjet operator. In addition the operator has to respond to a flashing indicator light on the robot every two minutes and reactivate the equipment's control system on the control box otherwise the machine will automatically shut down.

For further information please contact: Lars-Goran Nilsson or Carl Strömdahl, Conjet AB, P.O. Box 507,



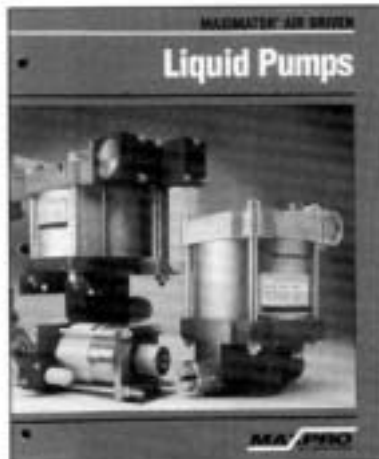
All hydrodemolition functions are controlled from a hand portable, remote control console ensuring safe operation for the Conjet operator.

S-136 25 Haninge, Sweden, phone: [46](8)741-3940, fax: [46](8)741-3960, e-mail: [conjet@conjet.se](mailto:conjet@conjet.se), website: <http://www.conjet.se>.

# New Equipment, Products, Developments

## New Catalog Describes Air Driven Liquid Pumps

A new 16-page catalog featuring high efficiency Maximator® air driven liquid pumps designed for oil, water and chemical applications is available from MAXPRO Technologies. These pumps provide outlet pressure ranges from 30 to 80,000 psi. Pump weights range from 6 to 50 pounds.



These easy-to-install pumps are an economical source for hydraulic power. A pilot air valve for easy restart and greater pressure control range is provided on L series pumps.

The catalog describes eight different series of pumps. All are explosion proof and require no lubrication or electrical power. Series CPO, PPO, S and LO are designed for oil or oil/water service with maximum outlet pressure to 14,500 psi. Series PP, for water or oil service range to 58,000 psi, while series L pumps range to 80,000 psi. The chemical service pumps, series PPSF with pressures to 14,500 psi and series LSF with pressures to 23,200 psi complete the Maximator line.

Technical information provided in the catalog includes outlet pressures, pressure ratios, connections, weights, flow charts and line drawings.

MAXPRO Technologies also offers a complete line of gas boosters and air amplifiers, as well as a wide variety of test stands and gas bottle filling stations.

For more information, contact MAXPRO Technologies, 2010 Filmore Avenue, Erie, PA 16506, or phone: 814-838-1416, fax: 814-838-2730.

## New Jet Edge Attenuator Meets TÜV & ASME Standards For High Pressure Vessels

A new attenuator designed by Jet Edge, a leading manufacturer of ultra-high pressure waterjet equipment, has earned certification from TÜV Rheinland, one of the world's largest and most reputable testing agencies.

(continued on page 13)

## "WATERJET ORIFICES"

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# WJTA COMMITTEES

The following are committees in effect in WJTA and the present members of these committees. WJTA members are urged to contact WJTA President George Savanick if they wish to serve on any of these committees.

**Awards Committee:** Recommends recipients of WJTA awards.

Forrest Shook, Chairman  
Mohamed Hashish, Ph.D.  
Thomas Kim, Ph.D.  
John Wolgamott

**Bylaws Committee:** Recommends changes to WJTA bylaws.

David Summers, Ph.D., Chairman  
John Wolgamott  
Bruce Wood

**Contractors Committee:** Is responsive to needs of waterjetting contractors and users of mobile waterjetting equipment.

Bruce Wood, Chairman  
Andrew Conn, Ph.D.  
Pat DeBusk  
John Wolgamott

**Manufacturers Committee:** Responsive to interests of in-plant waterjetting applications.

Mohamed Hashish, Ph.D.,  
Chairman  
Thomas Kim, Ph.D.  
Tom Labus

**Membership and Public Relations Committee:** Recommends policies to increase membership in WJTA.

Andrew Conn, Ph.D., Chairman  
Lydia Frenzel, Ph.D.  
Mike Gracey  
Thomas Kim, Ph.D.

**Nominations and Elections Committee:** This committee oversees election of board members.

Andrew Conn, Ph.D., Chairman  
Paul Bowser  
Lydia Frenzel, Ph.D.

**Safety Committee:** Recommends changes to safety manual.

George Savanick, Ph.D., Chairman  
Craig Anderson  
Pat DeBusk  
Ron Hyziewicz  
Arthur Miller  
Forrest Shook  
David Summers, Ph.D.  
Bruce Wood

**Safety Video Committee:** Plans and oversees the production of a video tape version of *Recommended Practices for The Use Of Manually Operated High Pressure Waterjetting Equipment*.

George Savanick, Ph.D., Chairman  
Pat DeBusk  
Forrest Shook  
David Summers, Ph.D.  
Bruce Wood

**Short Course Committee:** Plans and oversees the course *Fluid Jet Technology - Fundamentals and Applications*.

Tom Labus, Chairman  
Andrew Conn, Ph.D.  
Lydia Frenzel, Ph.D.  
Mohamed Hashish, Ph.D.  
David Summers, Ph.D.  
Bruce Wood

**Technical Research Committee:** Responsive to the needs of waterjet researchers.

Thomas Kim, Ph.D., Chairman  
Mohamed Hashish, Ph.D.  
Tom Labus

**10<sup>th</sup> American Waterjet Conference Committee:**

Pat DeBusk, Chairman  
Paul Bowser  
Thomas Kim, Ph.D.  
George Savanick, Ph.D.  
Mohan Vijay, Ph.D.

**11<sup>th</sup> American Waterjet Conference Site Selection Committee:**

Paul Bowser  
Thomas Kim, Ph.D.  
George Savanick, Ph.D.  
Mohan Vijay, Ph.D.

To volunteer for any of these WJTA committees, contact:

George A. Savanick, Ph.D.  
President  
Waterjet Technology Association  
917 Locust Street  
Suite 1100  
St. Louis, MO 63101-1413  
Telephone: (314)241-1445  
Fax: (314)241-1449  
E-mail: [wjta@aol.com](mailto:wjta@aol.com)  
Website: <http://www.wjta.org>



## Letters To The Editor

Dear Jet News:

We seem to be getting into rebuilding pumps, guns, foot pedals etc. I would like to know if there would be any courses available that teach this sort of thing, or are there any other avenues open to me?

Kind regards,

Danny Coyle  
Operations Manager  
Hughes Hydro Cleaning

Dear Jet News:

Thank you very much for your information on waterjets. We are currently looking to purchase either a plasma, laser or waterjet very soon. We would like 72 by 120 capacity but would consider other sizes close to this range.

If any of your members have new or like new waterjetting equipment available we would be very interested.

I can be contacted at Highlight Industries, 2694 Prairie Street SW, Wyoming, MI 49509, (616)531-2464.

Thanks, again for the information at your web site.

Kurt

Do you have suggestions, comments or questions of your own? Send your letters to: Editor, *Jet News*, 917 Locust, Suite 1100, St. Louis, MO 63101-1413, fax: (314)241-1449.

## Awards — Best Papers

From left Abdul Hafiz Osman, Mohamed Hashish, Ph.D. and Gabriel Houssaye. Dr. Hashish, chairman of the WJTA awards committee, presented Messrs. Osman and Houssaye an award for the best research paper at the 9th American Waterjet Conference. The title of the paper was "Visual Information Of The Mixing Process Inside The AWJ Cutting Head." D. Buisine and B. They also received an award for authoring this paper, but are not pictured.



From left Doug Wright, Mohamed Hashish, Ph.D. and Jerry Zink. Messrs. Wright and Zink were honored for authoring the best applications paper at the 9th American Waterjet Conference. The title of the paper was "A Study Of Rotary Jets For Material Removal." Not pictured is John Wolgamott, also a contributing author for this paper.



From left Bruce Wood and Mohamed Hashish, Ph.D. Mr. Wood of MPW Industrial Service, Inc. accepted the award for the best application paper presented at the 8th American Water Jet Conference for the author Larry Moers. The title of Mr. Moers paper was "High Pressure Water Blast Training: A Primer For Training Your Trainer."



From left Mohamed Hashish, Ph.D. and Mohan Vijay, Ph.D. Dr. Vijay was honored for authoring the best research paper at the 8th American Water Jet Conference in 1995. The title of the paper was "Computational Fluid Dynamic Analysis and Visualization Of High Frequency Pulsed Water Jets." Mark Lai and Ming Jiang also received an award for authoring this paper, but are not pictured.

## New Equipment, Products, Developments, from pg. 10

The TÜV certification signifies that Jet Edge meets what are considered to be the world's most demanding design and construction standards for high-pressure vessels.

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The EC Directives require that any certification must be issued by an authorized EU Notified/Competent Body — an independent testing house or laboratory authorized by its government to perform the conformity assessment tasks specified in the directives.

Certification of the new Jet Edge attenuator was issued by TÜV Rheinland of North America, Inc. — a Nationally Recognized Testing Laboratory (NRTL) accredited by the Occupational Safety and Health Administration (OSHA). TÜV Rheinland provides pressure-equipment and materials-technology certification, testing and consultation services to assure compliance with

European, German and International standards.

The new Jet Edge attenuator also meets requirements of the American National Standard (Section VIII, Division 3, Alternative Rules of Construction of High Pressure Vessels) of the American Society of Mechanical Engineers (ASME). This national standard ensures that newly constructed pressure vessels will perform in a safe and reliable manner.

The effectiveness of this newly designed Jet Edge attenuator has been further proven through extensive R&D testing, Finite Element Analysis computer simulation, and by Jet Edge waterjet equipment users in the field.

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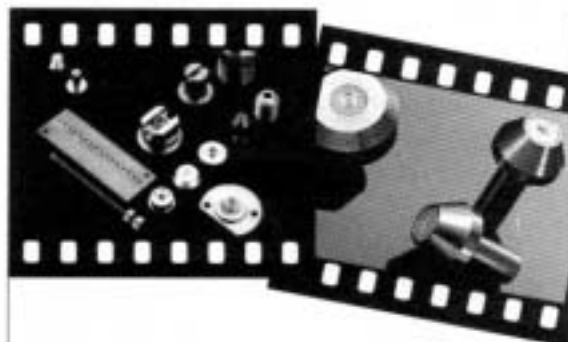
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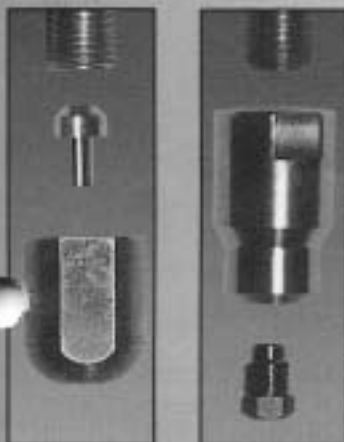
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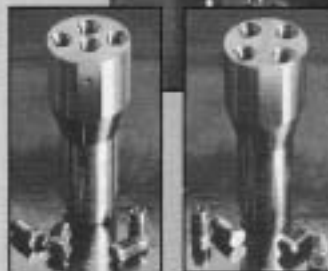
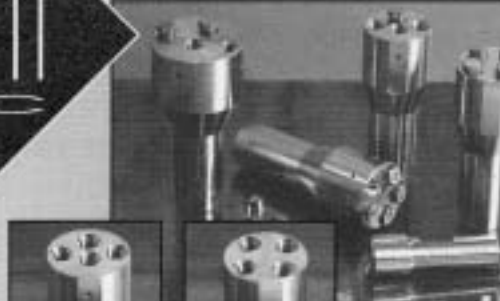
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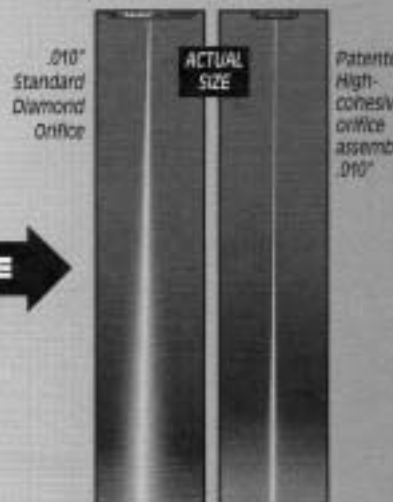
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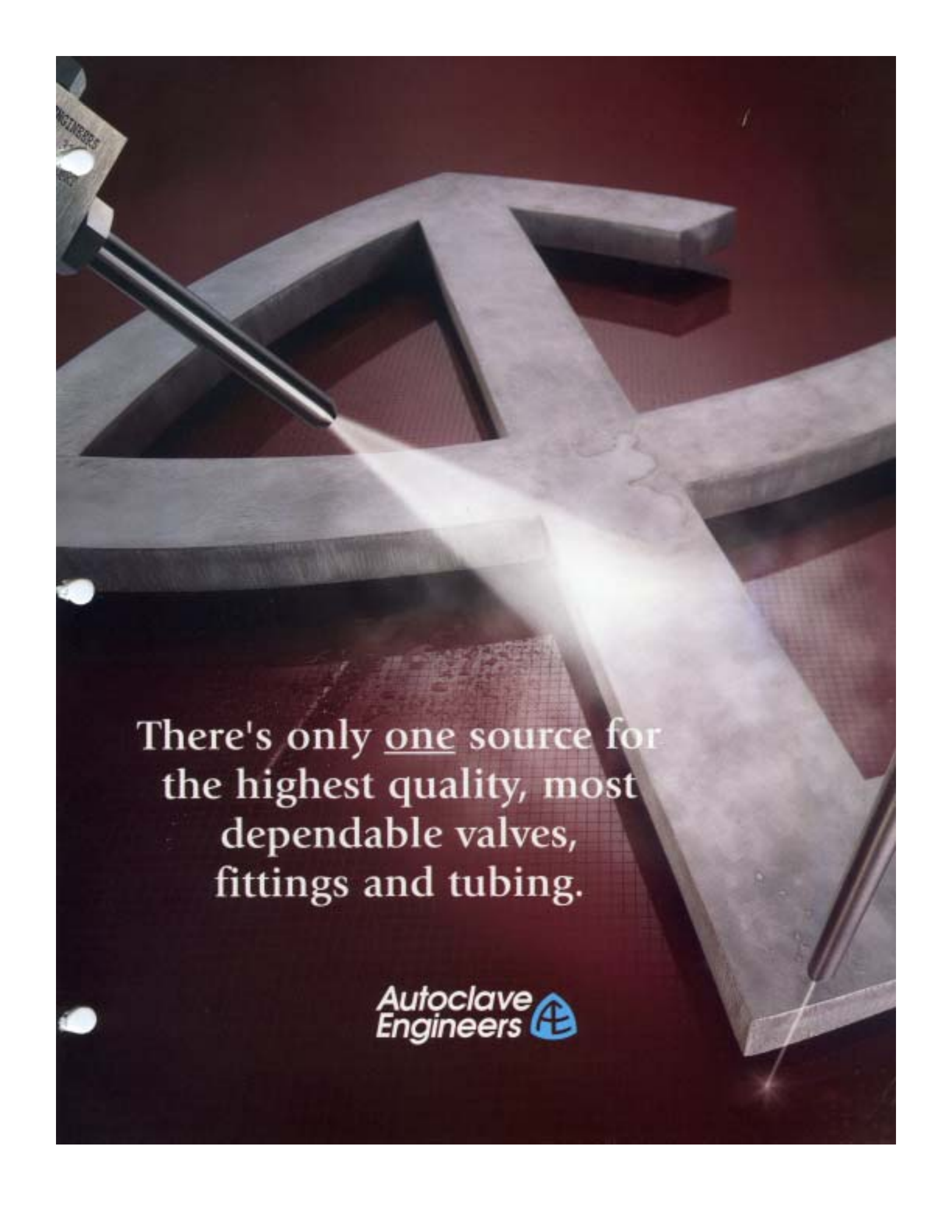
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