

WJTA Jet News

Water Jet Technology
Association



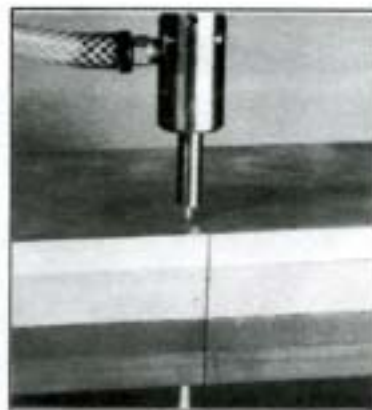
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Learn The Latest Advances In Water Jet Technology At The 7th American Water Jet Conference

New Applications....The Latest Equipment....Live Demonstrations



Learn more about the growing number of applications for water jets at the 7th American Water Jet Conference. These photographs represent a few of the applications in use today. From left, a water jet is used to clean a heat exchanger tube bundle (photo courtesy of Butterworth Jetting Systems, Inc., Houston, TX); a water jet tears through latex rubber material (photo courtesy of NLB Corporation, Wixom, MI); and an abrasive water jet cuts aluminum, Kevlar, glass, and phenolic (photo courtesy of Ingersoll-Rand Water Jet Cutting Systems, Baxter Springs, KS).



Visit the Conference Exhibit Hall to see the latest equipment and supplies available.



See how water jetting equipment operates and view water jets in action during the Technical Tour and Field Demonstrations.



See details on page 2.

See the power!

Live demonstrations of water jetting equipment and systems will be featured during the Technical Tour and Field Demonstrations on Tuesday, August 31 at the 7th American Water Jet Conference.

The preliminary list of participating firms includes:

Flow International Corp.
HiPr-Blast Services, Inc.
HydroSabre Technologies
Quest Integrated, Inc.
Utilx Corp.

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7th American Water Jet Conference

The latest information about applications for water jet technology in the construction, concrete, mining, drilling, and manufacturing industries, as well as novel applications will be featured at the 7th American Water Jet Conference, August 28-31, 1993, at the Red Lion Hotel/SeaTac in Seattle, Washington.

A short course on the basic techniques and applications of fluid jet technology, including suggested safety procedures for operating water jetting equipment, will be presented in conjunction with the conference on Saturday, August 28.

The Conference program, including over 70 papers, will cover a wide range of scientific and technical topics. General technology sessions will be held concurrently with specialty sessions designed for contractors/users and manufacturers.

The **Contractors and Users Workshop** scheduled for Sunday, August 29 includes topics on equipment maintenance and selection, ways to expand and improve services, safety and environmental practices, and industry trends.

Manufacturers will learn how fluid jet technology can improve their bottom line at the **Symposium on Manufacturing Applications**, Monday, August 30. Process control, advanced machining methods, automated systems, and new components and processes are among the topics to be covered.

See the latest water jetting equipment and supplies during the Exhibit on Sunday, August 29-Tuesday, August 31. Live demonstrations of water jets in action will highlight the technical tour of several firms in the Seattle area.

To register for the 7th American Water Jet Conference, contact the Water Jet Technology Association by telephone at (314)241-1445 or by fax at (314)241-1449.

Authors honored for outstanding papers

Richard H. Hollinger and **R.J. Mannheimer**, formerly of the Southwest Research Institute in San Antonio, Texas, and **Arthur L. Miller** and **John H. Archibald** of the U.S. Bureau of Mines, U.S. Department of the Interior, Minneapolis, Minnesota, have each been honored by the Water Jet Technology Association for the preparation and presentation of the most outstanding papers presented at the 6th American Water Jet Conference held in Houston, Texas, August 1991. The papers include "*Rheological Investigation of the Abrasive Suspension Jet*" by Messrs. Hollinger and Mannheimer and "*Measurement of Particle Velocities in an Abrasive Jet Cutting System*" by Messrs. Miller and Archibald.

The papers were chosen from over 75 papers presented at the 1991 Conference. Criteria considered in the selection of the award includes an evaluation of the quality of the oral presentation, the degree to which the paper follows editorial guidelines, the originality of the content of the paper, the absence of advertising in the paper or presentation, and the value of the contribution to the state of the art of water jetting.

Each author will be recognized with an award, in the form of a plaque, during the Water Jet Technology Association Awards Banquet on Monday evening, August 30, at the 7th American Water Jet Conference. **Dr. William Lees**, representing **Rogan and Shanley, Inc.**, the sponsor of the award, will make the presentation.

Process For Cutting With Coherent Abrasive Suspension Jets

Cuts the width of a human hair can be made through quartz computer chip wafers using an abrasive water jet cutting tool developed at Southwest Research Institute (SwRI).

The U.S. Patent "Process for Cutting with Coherent Abrasive Suspension Jets" was awarded earlier this year for an improved water jet knife that is more efficient and cuts much finer than conventional abrasive jets used to cut steel, concrete, and lightweight composites. It uses only 30% as much power, 40% less abrasive, and makes cuts (kerfs) that are only 1/10 as wide.

Co-inventors are former SwRI employee Richard H. Hollinger and William D. Perry, assistant director, SwRI Department of Space Systems, Instrumentation and Space Research Division.

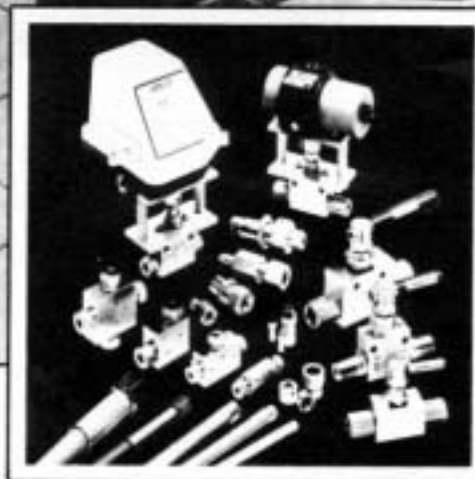
Perry said the improved performance was achieved by greatly increasing the abrasive particle velocity and by decreasing the cross-sectional area of the jet. These enhancements were obtained by suspending the abrasive particles in water using a viscous polymer additive and then passing the mixture at high pressure through a tiny orifice, creating the coherent abrasive suspension jet. In this way, the suspended abrasive is coherent with the water jet and has the same velocity. Because the abrasive is added before the water jet forms there is little dispersion and the jet retains its slim cross section until impacting the material to be cut.

A viscoelastic polymer such as SUPER-WATER® is used to keep the abrasive in suspension. With its use, the coherent jet configuration is even better maintained and more cutting energy is delivered onto the target material.

Perry explained that in conventional abrasive jet knives, the abrasive, such as garnet sand, is entrained into the water after the jet has been formed. When the high velocity water contacts the low velocity abrasive particles, the jet disperses into a wider stream, even when using a tungsten carbide collimating cone to re-concentrate the flow. Besides the increased dispersion, mixing inefficiencies in the entrainment process prevent the abrasive

(continued on page 7)

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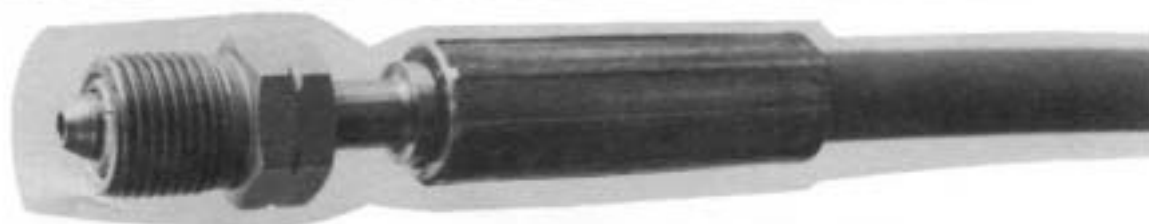
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Jet Cutting Hose

NEW!

The new Polyflex 8005St Jet Cutting hose is now in stock and available for immediate delivery!

The new hose features extremely high burst pressure, outstanding fatigue resistance and excellent flexibility, and is highly recommended for extreme pressure applications such as ultra-high water jetting and jet cutting.



The New 8005St Jet Cutting Hose **Specifications**

Burst Pressure:	120,000 psi
Max. Working Pressure:	60,000 psi (with shield)
Standard Working Pressure:	48,000 psi
Bore Diameter:	0.17"
Outside Diameter:	0.57"
Min. Bend Radius:	12"
Weight (lb/ft):	0.35
End Fittings:	3/8" and 9/16" HP Tubing Nipples

Come and see this and other exciting new Polyflex products at the 7th American Water Jet Conference, August 28-31 in Seattle - Booths 124 and 125.

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New Multi Dump Gun Control System

Butterworth Jetting Systems, Inc., has announced the addition of a new Multi Dump Gun Control System to its existing line of high pressure water jetting equipment.

Butterworth's new hand adjustable Control System (patent pending) is designed for any water jetting application requiring pressures up to 20,000 psi and flow rates to 65 gallons per minute. Unlike any other accessory available in the industry today, this unique Control System allows independent operation of multiple Dump Guns from a single source while maintaining constant pressure regardless of each gun's status.

The key components of the Multi Dump Gun Control System are the new hand adjustable flow control valves, which are self locking. The unique control valve design minimizes pressure surges and ensures safety and ease of handling for the operators. Also, due to its compact design any number of hand or foot guns may be added to the system, which is fully adaptable to all other manufacturers' water jetting systems.

Other features of Butterworth's new Control System include stainless steel construction of components and large, heat-treated valves and seats that provide exceptional efficiency and ensure low internal wear. Unlike other designs that incorporate flow restructure cartridges, Butterworth's large valves and seats provide the low pressure drop that is required for all high flow operations. In addition, all wear components of the control valves are quickly and easily replaced.

The unit's manifold is drilled and tapped for slimline 9/16" connections for 20,000 psi applications but is furnished with standard NPT adapters for lower pressure operation. Supplied as a standard feature of the Control System, are three sets of impact rings for 10,000, 15,000 or 20,000 psi. The overall dimensions are 10-1/2" L x 10" W x 7-1/2" H.

For more information, contact Butterworth Jetting Systems Inc., 3721 Lapas Drive, PO Box 230312, Houston, TX 77223-0312 USA, (713)644-3636, (800)231-3628, FAX (713)643-1514.

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- **Water Feed System**

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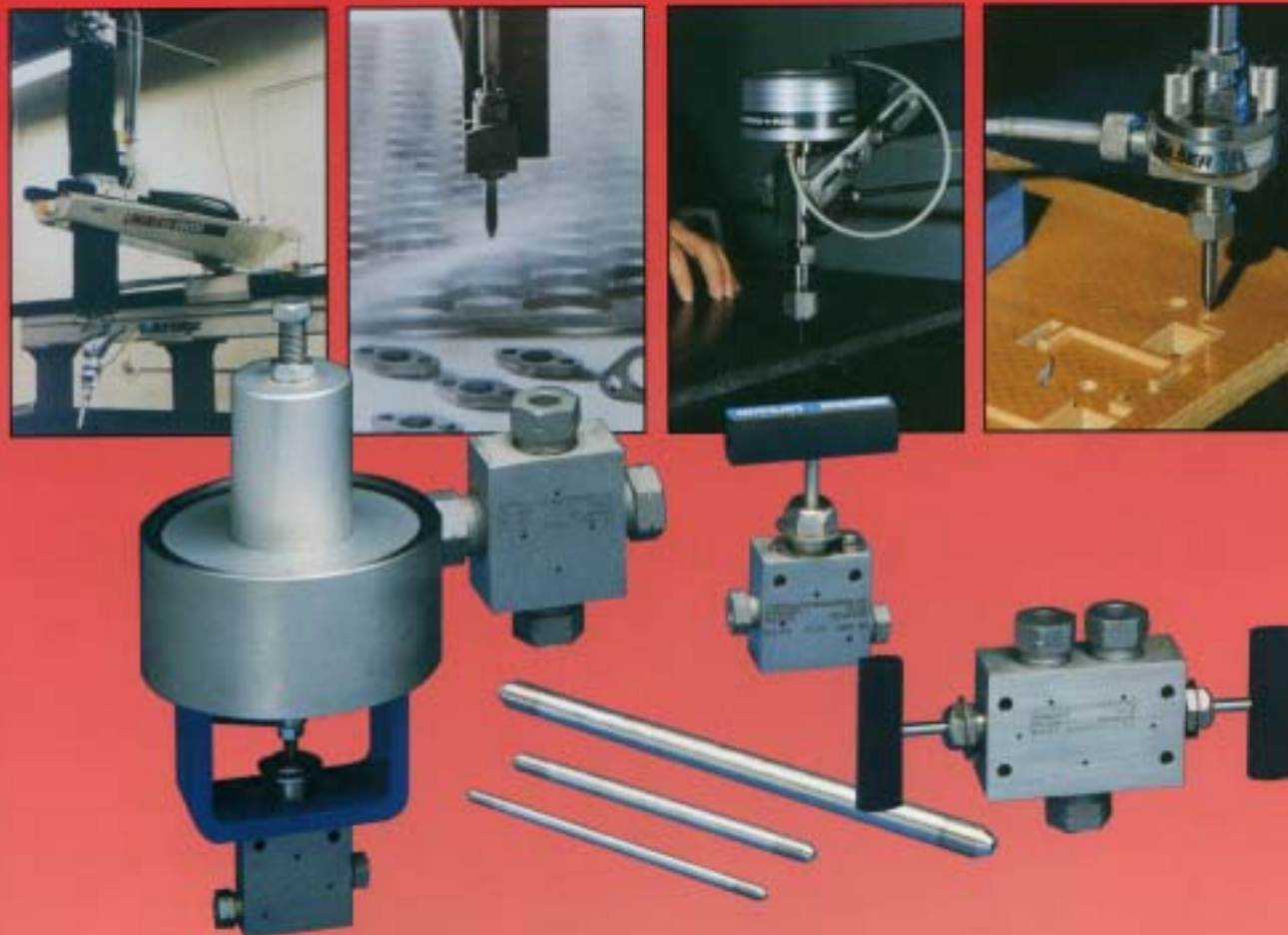
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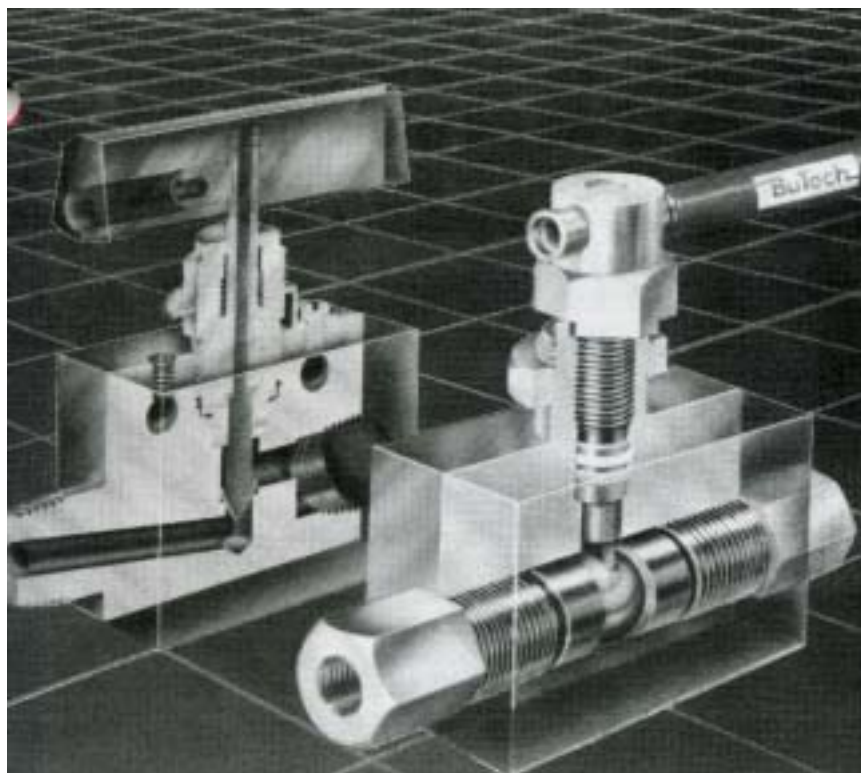
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Contact Frederick A. Boos at the
7th American Water Jet Conference - Seattle

Process For Cutting, from page 3
particles from being accelerated to that of the jet velocity, further reducing effectiveness.

In developing the new system, experiments were conducted with a conventional abrasive water jet to directly measure the velocity of crushed iron particles in the jet using an electromagnetic method. A large percentage of the particles, it was observed, never accelerated to the jet velocity and, so, contributed little to the cutting."

"Because the abrasive is already entrained in our suspension jet, there are no mixing inefficiencies and all of the abrasive is effective," said Perry. "As a result, the velocity of the jet, the pumping power, the water pressure, and the amount of abrasive can all be reduced. A collateral benefit from mixing, and thus wetting, the abrasive with water," he continued, "is the elimination of sparking when cutting most materials. This problem prohibits the use of conventional abrasive jet systems in some applications."

Perry's SwRI team has made several compact, low horsepower, coherent abrasive suspension jet systems for special applications. Even at one of their lowest operating pressures of 7500 psi, quarter-inch-thick steel can be cut at a rate of two inches a minute, using only 0.09 pounds of abrasive per inch of cut. Quartz wafers 0.006" thick can be cut with kerf widths of 0.003" to 0.004" spaced only 0.011" apart.

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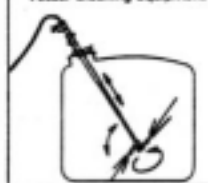
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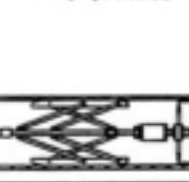
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