

# WJTA

Water Jet Technology  
Association



# Jet News

FEBRUARY 1993

*Published by the  
Water Jet Technology  
Association  
for the benefit of its  
members*

818 Olive Street, Suite 918 • St. Louis, MO 63101-1598, USA • Telephone: (314)241-1445, Fax: (314)241-1449



Rotating water jets (36,000 psi), mounted on the computer guided carriage of the Porta Blaster, blasts away unsound material from concrete arch. Photograph courtesy of Jet Edge, Inc, Minneapolis, Minnesota.

## Hydrodemolition: Proven On Historic Bridge

One of the longest concrete arch bridges in North America, located in Minneapolis, Minnesota, is now closed for a two-year renovation. For sixty years the historic Mendota Bridge has provided a vital link across the Minnesota River for the movement of goods and services.

Originally built as a railroad bridge in 1926 and widened over forty years ago, the ten concrete arches have seen the traffic of millions of cars and trucks. The decades of heavy service plus the harsh climate have taken their toll on this grand structure necessitating a complete structural renovation.

The Minnesota Department of Transportation (MnDOT) and historic preservation groups desired to restore the classic concrete arches while adding a new deck and traffic lanes. This demand coupled with the environmental concerns due to the bridge spanning a scenic wildlife refuge, dictate a slow impact method be used. Therefore, MnDOT has approved only two methods for removing the spalled and delaminated concrete portions of the arches prior to shotcrete material replacement.

The methods under consideration: hand-held 15 pound chipping hammers and water jet hydrodemolition. With the top of the arches reaching over 100 feet above the river, hand-held impact tools on swing stages appear impractical given the enormous manpower (continued on page 2)

### Photo Highlights

**Water Jet Cutting  
of Food Products  
In This Issue**



**Food products cut by water jet.**

Photograph courtesy of Mohan Vijay.

**See additional photos throughout this issue.**

## From The President's Desk...

The Water Jet Technology Association Board of Directors met in Chicago on December 12, 1992. The Board decided that the revised publication, "Recommended Practices for the Use of Manually Operated High Pressure Water Jetting Equipment" will be printed on 8-1/2" x 11" coated paper stock. The Board of Directors will have a final opportunity to review the draft "Recommended Practices" before the document is printed in time for the 7th American Water Jet Conference in August.

The Board of Directors reviewed plans and adopted a schedule of registration fees for the 7th American Water Jet Conference to be held in Seattle, Washington in August 1993. The Conference will be preceded on August 28, 1993, with a Short Course On Water Jet Technology. A section on manufacturing applications will be contained in this course.

The Conference will be held from August 29-31. General sessions and an equipment exhibit will be held on these days. A concurrent session of special interest to contractors will be held on August 29 and another concurrent session on manufacturing applications will be held on August 30. The Conference will conclude on the afternoon of August 31 with a tour of water jet cutting facilities in the Seattle area. Conference planning is proceeding well and all indications point to an interesting and successful Conference.

— George A. Savanick, Ph.D.

## WJTA Administration

### Chairman of the Board

Dr. Mohan Vijay  
(613)993-2731

### President/Newsletter Editor

Dr. George Savanick  
(612)725-4543

### Vice-President

Thomas J. Labus  
(414)275-5572

### Secretary

Dr. Andrew F. Conn  
(410)484-3628

### Treasurer

John Wolgamott  
(303)259-2869

### 1991-1993 Directors

William Hall  
(612)935-0903

Forrest Shook  
(313)624-5555

Dr. Mohamed Hashish  
(206)872-8500

Dr. David Summers  
(314)341-4311

Dr. Thomas J. Kim  
(401)792-2186

Dr. F. D. Wang  
(303)273-3653

George Rankin  
(713)864-6929

### Association Managers

Mark S. Birenbaum, Ph.D.  
Kenneth C. Carroll  
(314)241-1445

## Hydrodemolition, from page 1

requirements and the tight time schedule. Of even greater concern is the potential for additional structural damage, such as micro fracturing occurring to the sound material as a result of the hammering action.

Attention is now focused on the innovative water jet equipment manufactured and recently demonstrated for MnDOT by Minneapolis based Jet Edge, Inc. Jet Edge water jet equipment and technology is used by concrete repair contractors throughout the United States.

Two diesel-driven 36,000 psi Jet Edge intensifier pumps were towed to the bridge site along with the Jet Edge Porta-Blaster, a portable hydrodemolition unit. The 36,000 psi rotating water jets are mounted on the computer guided carriage of the Porta-Blaster. Moving along the high vertical arches at the operator pre-set feed rates, the water jets seek out unsound material and blast it away leaving a perfectly prepared patch area for material rebonding. Consistent removal depth and contour are delivered through the completely automated movement of the water jet. The Porta-Blaster can be programmed for random shapes as large as four feet on each side to easily handle the complex curves of the bridge.

A four hundred gallon water tank at the job site was sufficient to complete numerous large patch demonstrations performed for the MnDOT. An all terrain Gradall telescoping boom-lift positioned the automated Porta-Blaster to any location on the vertical bridge arches.

By harnessing the power and purity of water, the hydrodemolition process removes only the unsound concrete material without damage to the steel reinforcing bars in the base structure. This process is also responsible for further extending the useful life of this landmark bridge by removing and flushing the road salt residue from the pores of the concrete arches.

The demonstration yielded nearly a dozen full size patches with excellent edge quality and depth control exceeding both MnDOT and general contractors expectations and specifications.

For more information, contact Ron Neitzel, Jet Edge, Inc., 825 Rhode Island Avenue South, Minneapolis, MN 55426, Phone: (612)545-1477 or (800) JET-EDGE, Fax: (612)545-5670.





# BARTON

## Garnet

*nature's best deposit ...*

*man's best technology ...*

### *Quality*

The Barton deposit produces the hardest and sharpest garnet in the world. Enhanced by our state-of-the-art processing, Barton produces the highest quality and fastest cutting garnet available.

### *Consistency*

Barton garnet is graded to the tightest specs in the industry. This means more consistent operations, and less down-time due to clogged jets or erratic abrasive feed.

### *Service*

Barton's service, experience, and reliability have made us the world's largest supplier of garnet abrasives. Barton has been the world standard since 1878, and the water jet standard since 1982.

**(518) 251-2296**

**Fax: (518) 251-3655**

Barton Mines Corporation, North Creek, New York 12853

## New NLB Brochure Highlights High-Pressure Water-Jet Cleaning

A new brochure from National Liquid Blasting Corporation (NLB) features the company's high-pressure water-jet cleaning systems for automotive, contractor and industrial applications. Many examples from NLB's 21 years of solving tough cleaning problems are shown.

The 12-page, full color brochure describes how high-pressure water cleans virtually any kind of build-up quickly and efficiently, without chemicals, solvents or caustics. Photos show NLB equipment and automated systems performing in a variety of applications, while key specifications for the units – which deliver pressures from 10,000 to 36,000 psi – are provided in an easy-to-use reference chart.

The brochure also includes NLB's extensive line of heavy-duty pumps, lances, accessories, and patented products, such as SPIN NOZZLE® and rotating SPIN-JET® units. The company's facilities for manufacturing, engineering, research and development, spare parts, and training are also featured.

NLB, a leader in high-pressure water-jet technology, manufactures a full line of quality water-jetting systems for use in many industries. Typical applications include paint and sludge removal, surface preparation, tank cleaning, descaling, concrete demolition, abrasive jet cutting, and more.

For more information, contact David Yared, NLB Corporation, 29830 Beck Road, Wixom, MI 48393-2824, Phone: (313)624-5555, Fax: (313)624-0908.



Water jet cuts frozen trout. Nozzle diameter = 0.006"; Standoff = 0.5"; P = 40 KSI; Traverse = 25 in/min.

Photographs courtesy of Mohan Vijay.

## WATER JET ORIFICES

FOR HIGH PRESSURE CUTTING AND CLEANING

PRECISION SAPPHIRE ORIFICE ASSEMBLIES

READY FOR INSTALLATION INTO YOUR  
WATER JET SYSTEM



524 TINDALL AVENUE  
TRENTON, NJ 08610

PHONE (609)396-1577

FAX (609)695-4339

## Flow International Corporation Adds Keadle To Its Management Team

Flow International Corporation (*FLOW*) announced the appointment of William A. (Bill) Keadle to the position of senior vice president, construction products and services group.

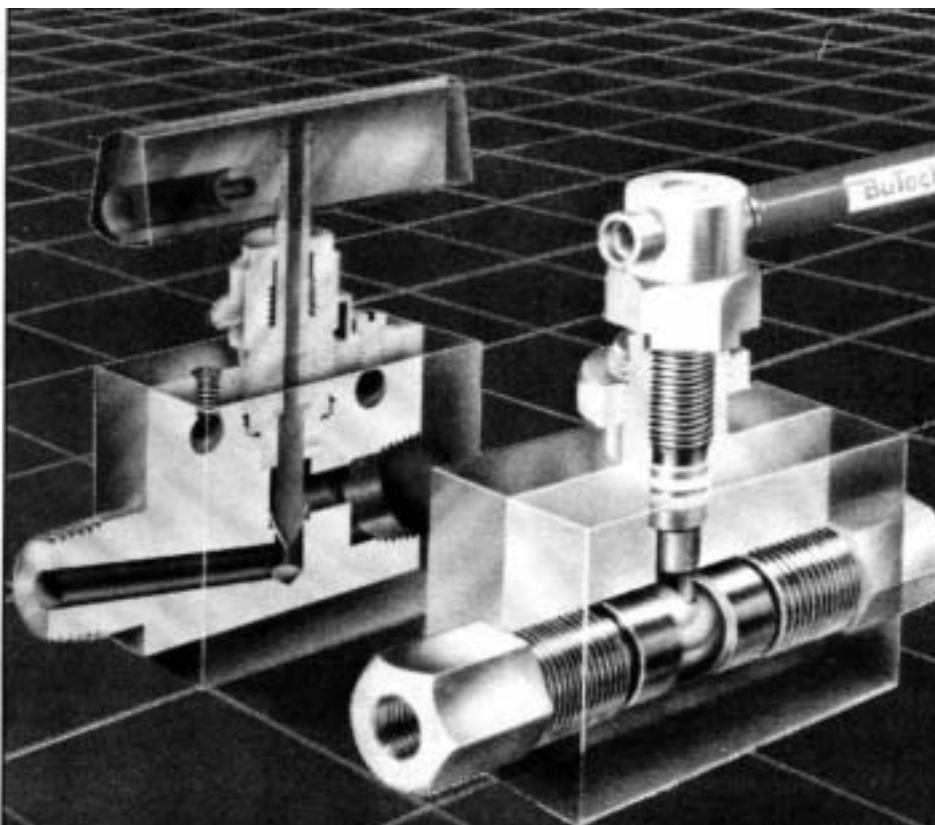
In this position, Keadle will spearhead the consolidation of all marketing and sales activities to the construction and related services industries. The construction products and services group includes all Spider branch operations, the *FLOW* environmental applications products (including the new Husky™ direct-drive pump), HydroMilling® and Hydro Cleaning™ services, and all powered scaffolding products in the United States.

"The addition of Keadle to our executive management team underscores the market potential for our powered scaffolding and industrial cleaning products and the synergies between our services group and our product sales," said Ronald W. Tarrant, president and chief executive officer.

Keadle brings extensive experience to his new role with *FLOW*. Most recently with Icom America, he served as vice president, sales and marketing. Previously the president of a Northwest company specializing in the sales and service of capital goods, Keadle has also held several marketing and sales management positions with IBM Corporation.

He is a member of the Seattle Rotary #4, president of Seattle Seafair, a member of the Seattle Chamber of Commerce, and a speaker for the Chamber on Total Quality Management.

Flow International Corporation is the world's leading manufacturer of ultrahigh-pressure waterjets for industrial cutting, cleaning, and HydroMilling® services; and North America's leading supplier of power-driven scaffolding systems.



## Finally. Pipe Valves Up To 15,000 PSI

**Butech introduces a line of pipe valves, fittings and accessories that really handle the pressure.**

Our new "Pipe Series" needle valves are designed to operate at working pressures up to 15,000 PSI. They are available in a variety of configurations for on-off, throttling and metering.

Ball valves are designed for working pressures up to 12,000 PSI and can be equipped for continuous operation up to 500°F or excursions up to 550°F.

Standard construction is of 316 cold worked stainless steel in sizes from 1/8" to 1" NPT. Valves and fittings can be manufactured in all machinable metals.

When you need to take your high pressure equipment to the extremes, call us. *Butech... "Performance Under Pressure".*



4928 Pittsburgh Ave. • Erie, PA 16509 • 814/833-4904 • Fax 814/833-2612



**New ratings!**  
**Even Wider Selection!**

**Rogan and Shanley, Inc.**  
**- a Polyflex company -**

## **High Pressure Steel Reinforced Thermoplastic Hose**

### **8000 St Series Hoses**

Highest working pressure hose, used for Water Jet Cutting and other extreme pressure applications

Type	Hose Size (in)		Nipple Insert ID"	Pressure Ratings (psi)		Min. Bend Radius (in)	Weight Lb/ft.
	ID	OD		Burst	Working		
8005 St	0.17	0.57	0.10	118,500	47,400	12	0.35

### **6000 St Series Hoses**

Versatile alternative to rigid tubing. Widely used for higher pressure water jetting and other high flow, high pressure applications.

Type	Hose Size (in)		Nipple Insert ID	Pressure Ratings (psi)		Min. Bend Radius (in)	Weight lb/ft.
	ID	OD		Burst	Working		
6005 St	0.20	0.50	0.10	90,620	36,250	6	0.25
6005 StV	0.20	0.58	0.10	90,620	36,250	7	0.27
6108 St	0.33	0.68	0.20	90,000	36,000	8	0.42
6013 St	0.50	0.97	0.34	65,000	26,000	12	0.79
6020 St	0.80	1.30	0.56	50,750	20,300	14	1.23
6025 St	0.98	1.57	0.70	45,310	18,125	15	2.00

6005 StV has an additional outer layer of stainless steel braid

### **4000 St Series Hoses**

Widely used for pressure testing, lubrication systems, high pressure hydraulic tools. Types 4005 through 4113 are ideal for 20,000 psi waterblasting.

Type	Hose Size (in)		Nipple Insert ID	Pressure Ratings (psi)		Min. Bend Radius (in)	Weight lb/ft.
	ID	OD		Burst	Working		
4005 St	0.20	0.43	0.11	65,000	26,000	5	0.17
4006 St	0.25	0.50	0.15	56,250	22,500	6	0.19
4008 St	0.33	0.61	0.21	57,500	23,000	7	0.23
4113 St	0.50	0.88	0.34	51,000	20,400	8	0.54
4120 St	0.81	1.14	0.63	37,500	15,000	10	0.80
4125 St	1.00	1.46	0.75	32,620	13,050	12	1.00

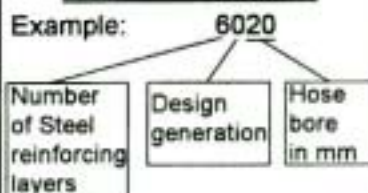
### **2000 St Series Hoses**

Very light, flexible hoses with low volumetric expansion. New generation 2200 Series hoses feature outstanding flexibility and kink resistance.

Type	Hose Size (in)		Nipple Insert ID"	Pressure Ratings (psi)		Min. Bend Radius (in)	Weight Lb/ft.
	ID	OD		Burst	Working		
2104 StPA	0.16	0.39	0.10	43,500	17,400	2.5	0.15
2206 St	0.25	0.52	0.15	30,000	12,000	3.0	0.18
2006 StA	0.25	0.49	0.15	33,000	13,200	3.5	0.17
2106 StPA	0.25	0.54	0.15	41,000	16,400	3.5	0.19
2108 St	0.32	0.56	0.20	34,000	13,600	3.5	0.20
2210 St	0.40	0.70	0.26	25,810	10,300	3.0	0.28
2013 St	0.50	0.81	0.38	21,000	8,400	5.5	0.35
2113 St	0.50	0.87	0.38	31,000	12,400	6.0	0.48
2213 St	0.50	0.75	0.37	24,070	9,600	4.0	0.38
2220 St	0.75	1.14	0.56	20,300	8,100	6.0	0.63
2225 St	1.00	1.37	0.75	16,420	6,500	8.0	0.84
2025ST	1.00	1.34	0.75	16,000	6,400	10	0.74

**Condensed 'Catalog'.**  
**Tear out and keep for your reference.**

#### **Hose Part Numbers**



#### **Rogan and Shanley Polyflex Hose Assemblies**

The international Polyflex Group is the leading manufacturer of premium quality high pressure steel reinforced thermoplastic hose.

#### **Quality**

All Rogan and Shanley hose assemblies are pressure tested and serial numbered for 100% traceability. All batches are burst and fatigue tested to ensure consistent high quality.

#### **Technical Support**

All Rogan and Shanley sales personnel have 'in-depth' product knowledge and experience to assist in the selection of the optimum product for your application. Custom products can be developed for specific needs.

#### **Reliable Service**

Rogan and Shanley is known for fast, dependable deliveries. Most orders are shipped within two days.

#### **Up-to-date information always at your fingertips**

For your convenience a constantly updated version of this condensed catalog can be faxed to you 24 hours a day, seven days a week. Just call (800) 4FAXCAT and follow the simple instructions. Use code 1513 and be sure to have your fax number handy.



# Small Hoses and Flexible Lances for Waterblasting

## 2000 St Series 10,000 psi Flexible Lances

Rugged, kink resistant flexible lances are conservatively rated for tough use. All lances have burst pressures in excess of 30,000 psi.

Construction: Delrin core, two layers high strength steel wire, Nylon 11/12 outer cover.

Type	Hose Size (in)		End Fitting (in)		Min. Burst Pressure (psi)	Min. Bend Radius (in)	Weight Lb/ft.	Comments
	ID	OD	ID	OD				
2004 StR	0.17	0.31	0.10	0.43	40,600	3.0	0.06	Delrin core, Nylon cover
2005 StR	0.20	0.42	0.13	0.49	40,600	3.5	0.13	Additional braided steel layer
2006 StA	0.25	0.50	0.17	0.58	33,000	3.5	0.17	Additional braided steel layer, Nylon core
Lances with additional abrasion resistant stainless steel outer braid:								
2004 StV	0.17	0.36	0.10	0.47	40,600	4.0	0.13	Delrin core, Nylon cover
2005 StV	0.20	0.42	0.13	0.49	40,600	4.5	0.14	Delrin core, Nylon cover
2006 StV	0.25	0.50	0.17	0.58	35,000	5.0	0.20	Delrin core, Nylon cover

## Hose End Fittings and Adapters

### Wide range of hose fittings and adapters available

'Autoclave' style High and Medium pressure, male and female.

Rogan and Shanley swivel nut fittings, Type M (Male cone, female nut), and Type F (Female cone and nut). BSP Swivel nuts and straight male threads. NPT male. JIC swivel nut. Special 'low profile' ends for tube cleaning.

Custom fittings for OEM applications are available. Many hose ends are available in plated carbon steel or stainless steel. Stainless steel adapters are available for many combinations of fitting types. Rogan and Shanley offers a range of hose accessories, such as light and heavy duty abrasion resistant covers, anti-kink spring guards etc.

## Quick-Connect Couplings

Type	Flow Dia.(in)	Working Press. (psi)
115	0.12	14,500
116	0.12	21,800
125	0.12	29,000
HP006	0.24	30,000
HP010	0.40	30,000

High pressure quick-connect couplings are available plated or unplated, with and without internal check valves. The nipples of types 115, 116 and 125 should not be pressurized in the disconnected position. Types HP006 and HP010 are fully rated connected or disconnected.

## Pressure Testing

Rogan and Shanley offers a pressure testing and autofrettage service up to 250,000 psi. Call for details.

***Rogan and Shanley, Inc - working with you to find a better way***

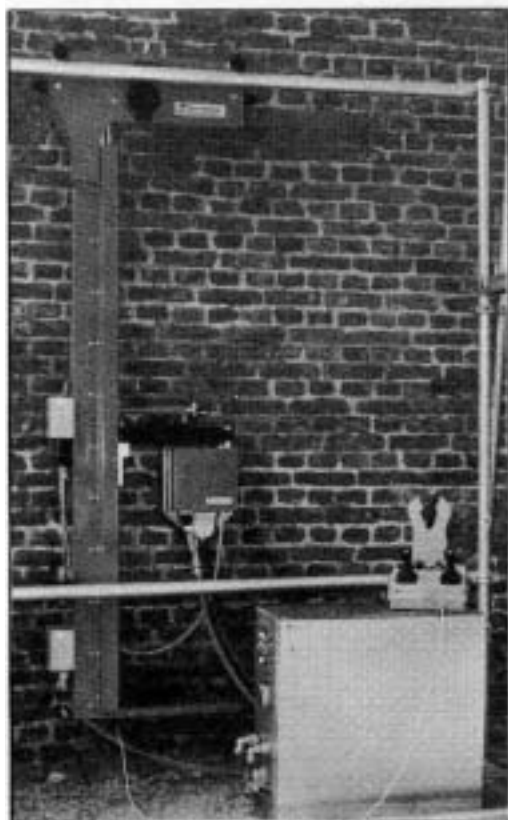
For more details of Rogan and Shanley products call us at:

**(800) 446-5236**

Rogan and Shanley, Inc.  
4263 Dacoma,  
Houston, TX 7709

tel: (713) 686-5236  
FAX: (713) 686-1292

## German Technology Awards For Water Jetting Techniques



**FUGOMAT B 200 working at the site, Hamacher GmbH, Aachen.**  
Photograph courtesy of WOMA Apparatebau GmbH, Duisburg.

In 1992, two important German technology awards were conferred on water jet innovations.

During the BAUMA '92, the world's most important fair for construction machines, the "BAUMA Innovation Award" was given to the FUGOMAT B 200. This is a new tool for removing defective mortar joints in historic masonry. The small dimensions of the tool allow vibration-free clearing, even through relatively great depths, without damaging the surrounding original stone substance, even in the case of irregular joint courses. The FUGOMAT B 200 was developed by the Aachen University, Institute of Machines and Management in Civil Engineering. It consists of a high-pressure pump (up to 200 MPa) and a joy-stick remote controlled cutting unit which is a product of Hamacher Maschinenbau, Aachen.

Secondly, the German airline Lufthansa was honored with the "Ecology Award for Ecological Technologies" of the Federal Association of German Industry. Lufthansa and WOMA have developed the "Aquastripping" technique, a new

(continued, next column)

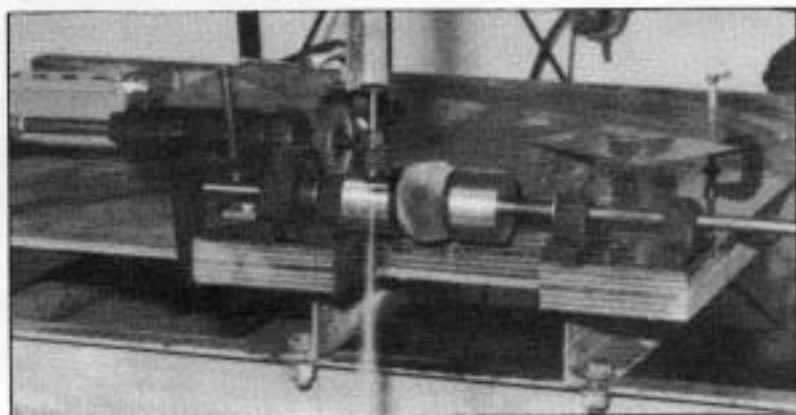


**Stripping paint from an airplane.** Photograph courtesy of WOMA Apparatebau GmbH, Duisburg.

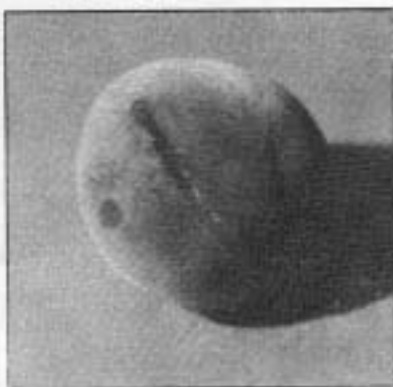
innovative method for partly automated aircraft paint removal using water jets. The heart of this solution are ten WOMA 325 Z plunger pumps which generate the working pressure of 50 MPa. By means of two manipulators, 90 to 95 percent of the aircraft surface can be processed automatically. The paint removal is possible without chemical agents.

Article submitted courtesy of WOMA Apparatebau GmbH.

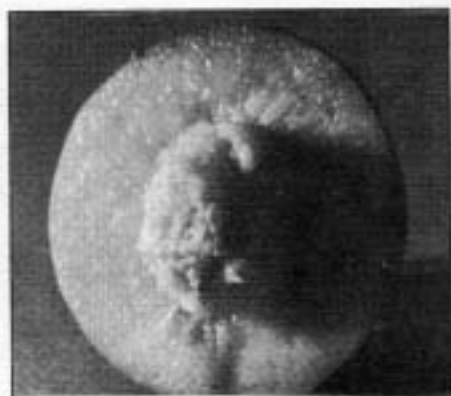
### **Water jet cutting of a peach to remove the stone prior to canning.** Photographs courtesy of Mohan Vijay.



**Cutting Process.**



**Attempted cut with a laser beam.**



**Cut with water jet.**



**Stop Throwing  
Your money Away  
Save 45% to 65%  
USE  
*SHARPJET*  
Premium Abrasive**

**\*Gentle on Equipment\***

**\*Giant Savings\***

**\*Dust Free\***

**\*Versatile\***

**For Further Information Call  
Minerals Research & Recovery, Inc.**

**800-875-0776**

## Food products cut by water jets



Sausage. Nozzle diameter - 0.010"; S.D. = 0.25"; P. = 40 KSI; Traverse = 400 in/min.



Broccoli. Nozzle diameter - 0.010"; S.D. = 0.25"; P. = 40 KSI; Traverse = 400 in/min.

Photographs courtesy of Mohan Vijay.

## Send Us YOUR News!

### Water Jet Technology Association

ATTN: Dr. George Savanick

818 Olive Street - Suite 918

St. Louis, MO 63101-1598, USA

Phone: (314)241-1445

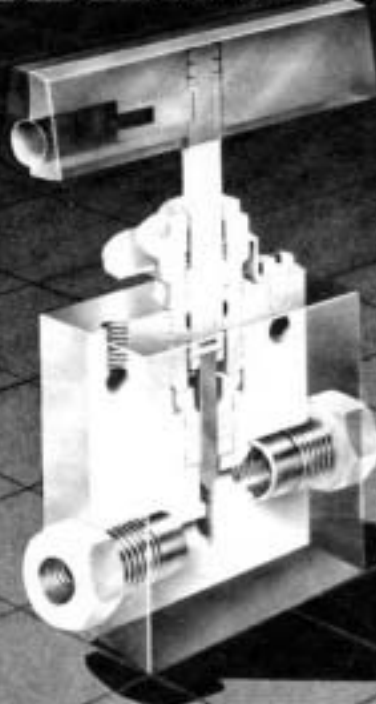
Fax: (314)241-1449

*Jet News* is published by the Water Jet Technology Association and is a benefit of membership in the Association.

© 1993 *Jet News*. All rights reserved. Reproduction in any form forbidden without express permission.

The use of specific product names in the *Jet News* does not imply endorsement by the Water Jet Technology Association.

# Performance UNDER PRESSURE



To illustrate a point, Butech high pressure valves and fittings take water jet technology to the extremes. Our all corrosive resistant construction, with a choice of exotic alloy stem tips, guarantees long lasting pressure performance under extreme conditions. The non-rotating stem design, with adjustable packing below threads, allows precise control of gas and liquid flow at pressures from vacuum up to 150,000 psi. A variety of configurations and end connections are readily available.

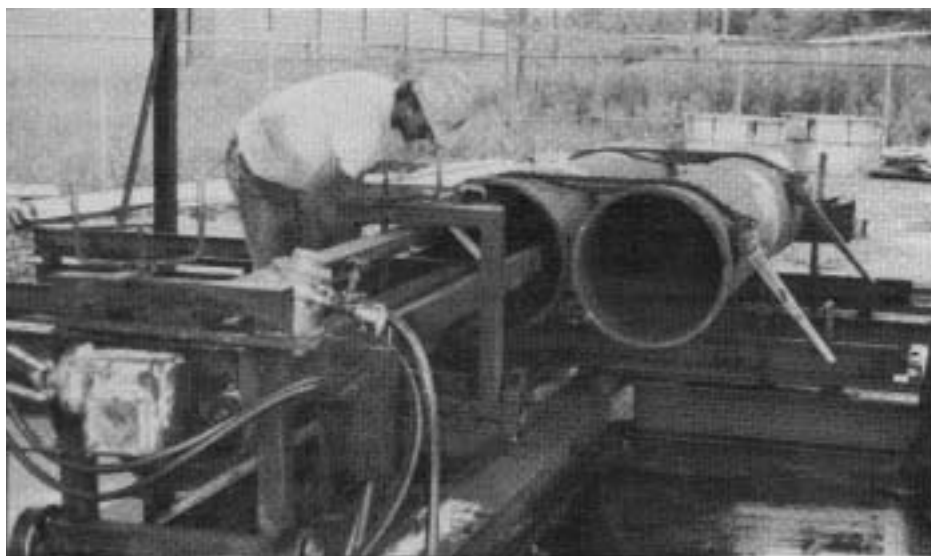
We also offer a complete line of high pressure fittings, carefully engineered to meet all of your specific requirements.

When you need to take water jet technology to the extremes, call Butech. Because when the pressure's on . . . Butech performs.

**BuTech**  
PRESSURE SYSTEMS

4928 Pittsburgh Avenue • Erie, PA 16509 • 814/833-4904 • FAX 814/833-2612





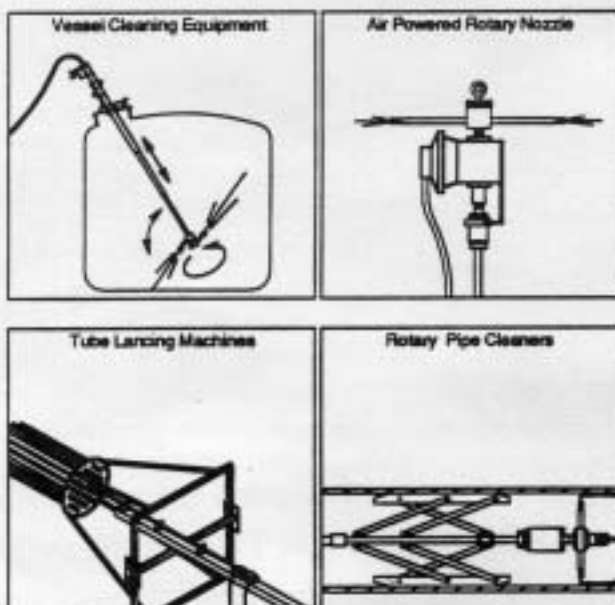
**Cannister Cleaner -**  
Mechanical drilling with carbide drag bits, combined with high pressure water jets. Photo below illustrates machine in operation. Photo at left illustrates cannister cleaner being used to clean very hard and abrasive deposits out of expensive stainless steel canisters. These canisters are molds for baking graphite electrodes. Operates at 10,000 psi and 20 gpm.

Photographs courtesy of StoneAge, Inc., Durango, Colorado.

## **STONEAGE**

WATERJET ENGINEERING

**Manufacturers Of Rotary  
Waterblasting Equipment  
and  
Mechanized Cleaning Systems**



**STONEAGE** tools get the work done. All **STONEAGE** products features state-of-the-art waterjet technology and safety. Field tested and proven on hundreds of jobs worldwide. Our tools are practical in design, easy to use and simple to service. For additional information please contact **STONEAGE**.

**(303) 259-2869**

54 GIRARD STREET \* DURANGO, CO \* 81301



**See you at the  
7th American  
Water Jet  
Conference**

**August 28-31, 1993  
Seattle, Washington**

## PHILLIPS MACHINING & REPAIR SERVICE

28624 27th Place South  
Federal Way, WA 98003 USA  
Phone: (206)839-2582  
Fax: (206)941-6893  
24 hours a day - 7 days a week

Prototype work - Custom Machining  
Designing - Confidential Free Estimates -  
References

We specialize in UHPW Components. We make nozzles - fittings - parts on hand. Some cases next day delivery. We can work from sketches, prints or sample parts. No job too small or too large. When you need fast, accurate, dependable service you can count on, call or fax - PHILLIPS, "the service company."

**We understand downtime as well as  
on time - every time!**

**You've tried the rest, now call the BEST  
and ask for Joe Phillips.**

**Thank you.**

*Price list and brochure available upon request.*

# GARNET

The  
abrasive  
with  
GRIT

### Almandite Jet Cut Garnet

Our **jet cut** brand is the answer. Expect high productivity with our **jet cut** almandite garnet grains for high pressure water jet cutting applications. Our **jet cut** brand is the hardest, sharpest, heaviest, fastest cutting and cleanest of the garnet family. High density and high kinetic energy. Sizes from 8 through 250 mesh. 100 lb. bags. Sales Representative for Emerald Creek Garnet. For more information contact:

## MYERS

Myers Metals & Minerals, Inc.  
Norton Building  
801 Second Ave., Suite 1505  
Seattle, Washington 98104  
TEL: (206)622-2278  
FAX: (206)682-8829  
TLX: 759030

## The Water Jet Technology Association's

### 7th American Water Jet Conference

August 28-31, 1993

Red Lion Hotel - Sea Tac Seattle, Washington

### Preliminary Schedule of Events

#### SATURDAY, AUGUST 28

8:30 a.m. - Noon	Water Jetting Short Course
Noon - 1:30 p.m.	Luncheon for "Short Course Participants"
1:30 p.m. - 4:30 p.m.	Short Course (continued)
6:30 p.m. - 8:00 p.m.	Welcoming Reception

#### SUNDAY, AUGUST 29

8:30 a.m. - 11:30 a.m.	Water Jetting Contractors and Users Workshop
8:30 a.m. - 11:30 a.m.	Concurrent General Session
11:30 a.m. - 5:00 p.m.	Exhibits Open
12:30 p.m. - 1:30 p.m.	Luncheon in Exhibit Hall
1:30 p.m. - 4:30 p.m.	Contractors Workshop (continued)
1:30 p.m. - 4:30 p.m.	Concurrent General Session (continued)
4:30 p.m. - 6:00 p.m.	WJTA Biennial Business Meeting
6:00 - 7:30 p.m.	Reception in Exhibit Hall

#### MONDAY, AUGUST 30

7:30 a.m. - 5:00 p.m.	Exhibits Open
8:30 a.m. - Noon	Symposium on Manufacturing Applications
8:30 a.m. - Noon	Concurrent General Session
Noon - 1:30 p.m.	Luncheon in Exhibit Hall
1:30 p.m. - 4:30 p.m.	Symposium (continued)
1:30 p.m. - 4:30 p.m.	Concurrent General Session (continued)
6:00 p.m. - 11:00 p.m.	President's Reception and Awards Banquet Cruise

#### TUESDAY, AUGUST 31

7:30 a.m. - 10:30 a.m.	Exhibits Open
8:30 a.m. - Noon	General Session
12:15 p.m. - 6:15 p.m.	Technical Tour and Field Demonstrations

**Watch for more information in  
future issues of your Jet News.**

*The 7th American Water Jet Conference is endorsed by the  
International Society of Water Jet Technology.*