

## Flaming Fountain Memorial, from page 1

gas supply had dwindled and the cost of replacing the mains was prohibitive. There was still too much natural gas rising from the well to ignore, so the water was run underground and allowed to dissipate. However the natural flow stabilized the warm water lake. The flaming fountain idea was conceived, but it was not easy to keep the flame burning since water from the well did not flow smoothly. As it surged out in an irregular pattern, it extinguished the flame. Finally, a baffle fashioned out of scrap iron was able to keep the flame from being extinguished. The bubbling water contains an abundance of natural gas which produces a perpetually burning flame. The Flaming Fountain is the result of a well that struck a pocket of natural gas. The flame was ignited in August 1967, and has burned continually since that time.

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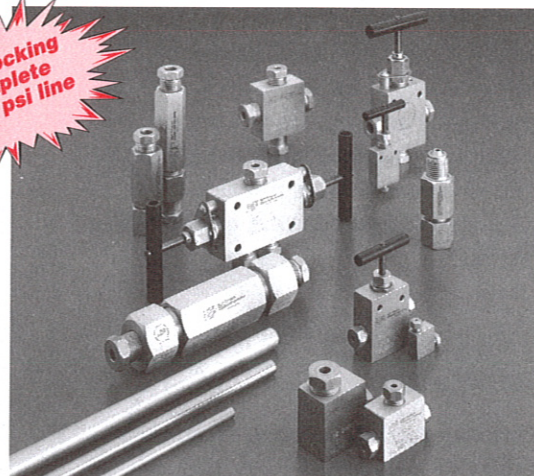
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**Jet News**

JANUARY 2001

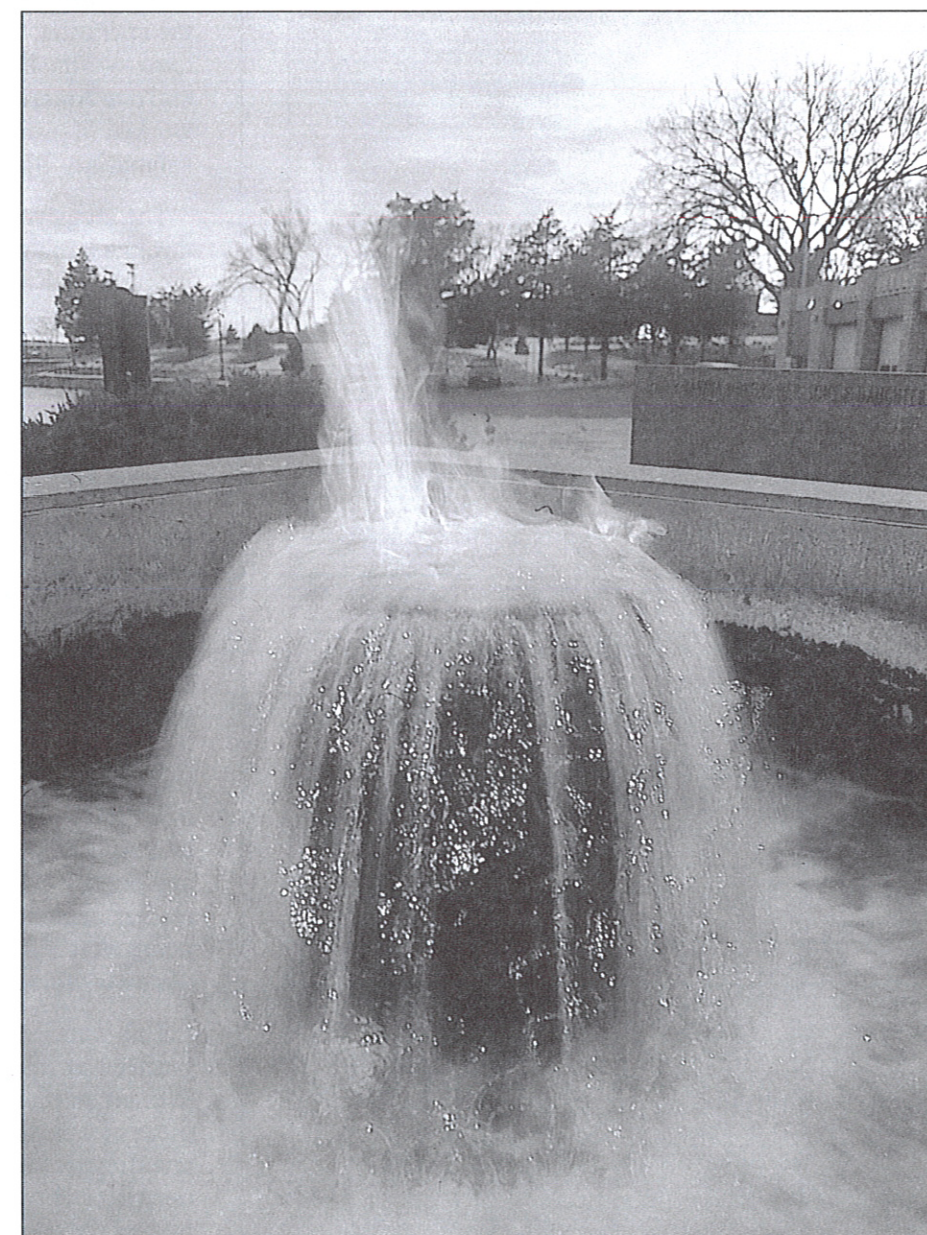
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## Flaming Fountain Memorial

**T**he Eternal Flaming Fountain is located on the northwest end of Capitol Lake on the grounds of the state capitol in Pierre, South Dakota. The Flaming Memorial was dedicated in 1972. The fountain was erected by Watertown Monument Works, Memorial Manufacturers, and consists of South Dakota Carnelian Granite. It has a granite screen on each side, and granite benches. Each screen has an inscription. The Fountain provides a perpetual flame to the memory of the men and women of South Dakota who have served in the armed forces. The flame is very high and is especially visible against the nighttime sky.

The well from which the Flaming Fountain rises was drilled in the winter of 1909-1910. The well has a depth of 1,350 feet and a flow of 1,620 gallons per minute and a water temperature of 92 degrees. It originally provided natural gas for the city of Pierre, and later was used to heat the Capitol Complex. In the late 1950's, the mains rusted out and gas escaping underground caused an explosion in the Health Department building. This incident prompted officials to abandon the well. Besides, the



The Flaming Fountain Memorial is a Veterans Memorial located on the shores of Capitol Lake in Pierre, South Dakota. It is a perpetually burning flame fed by natural gas. The monument is dedicated to the South Dakotans who have fought for their country in time of war. Photograph courtesy of South Dakota Tourism.

(continued on page 28)



The WaterJet Technology Association's  
**2001 American  
 Waterjet Conference**

August 18-21, 2001  
 Hyatt Regency Minneapolis on Nicollet Mall  
 Minneapolis, Minnesota

**Preliminary Schedule of Events**

**Saturday, August 18**

- |                       |   |
|-----------------------|---|
| 8:00 a.m. - 4:30 p.m. | Concurrent Sessions <ul style="list-style-type: none"> <li>• Short Course on the Fundamentals and Applications Of Waterjet Technology</li> <li>• Topic to be determined</li> <li>• Advanced Topics in Surface Prep</li> </ul> |
| 6:30 p.m. - 9:30 p.m. | Welcoming Reception In The Exhibit Hall — Exhibit Opens   |

**Sunday, August 19**

- |                       |  |
|-----------------------|--|
| 8:30 a.m. - 5:00 p.m. | Concurrent Sessions/Paper Presentations                            |
| 9:30 a.m. - 2:00 p.m. | Exhibit Hall Open<br>(Lunch served Noon-1:30 p.m. in Exhibit Hall) |
| 5:30 p.m. - 6:30 p.m. | WJTA Biennial Business Meeting                                     |

**Monday, August 20**

- |                        |  |
|------------------------|--|
| 8:30 a.m. - 5:00 p.m.  | Concurrent Sessions/Paper Presentations                            |
| 9:30 a.m. - 2:30 p.m.  | Exhibit Hall Open<br>(Lunch served Noon-1:30 p.m. in Exhibit Hall) |
| 6:30 p.m. - 11:00 p.m. | Awards Presentation/Party  |

**Tuesday, August 21**

- |                       |   |
|-----------------------|---|
| 8:00 a.m. - 3:00 p.m. | Technical Tour And Field Demonstrations |
|-----------------------|---|

**Abrasive Jet Used In The Recovery  
 Of Bodies From A Sunken  
 Submarine**

The Russian nuclear submarine "Kursk" sank on August 12, 2000, at a depth of 350 feet in the Barents Sea with loss of 118 Russian sailors. The Kursk is 500 feet long and it displaces 18,000 tons.

In October a direct injection abrasive jet cutting machine was used by a crew of Halliburton, Inc. divers to cut open the Kursk so that Russian divers could retrieve the bodies of the sailors. Russia hired Halliburton to help in the recovery operation. The Halliburton branch out of Aberdeen, Scotland, handled the operation. Twelve divers worked on the Halliburton crew — nine British, one Norwegian, one South African and one American. The twelve Halliburton divers worked in teams of three. Their job was to cut open the submarine. Six Russian divers recovered the bodies.

The abrasive jet operated at 15,000 psi. It first cut through a rubber sheeting covering the submarine. Then it cut through an outer steel hull less than one-inch thick. Finally, it cut a six-foot-wide hole in the three-inch-steel inner hull. The Russian divers were able to recover 12 bodies by October 31 when the recovery effort ended.

**Cranberry Harvesting With Waterjets**

This picture shows waterjetting in a cranberry marsh near Wisconsin Rapids, Wisconsin. The picture shows waterjets formed by forcing water through a flattened piece of tubing pushing cranberries toward the section opening of a pump attached to 8-in-diameter tubing.



This waterjet berry pusher is an innovation in cranberry harvesting. Typically growers attached a piece of 1-in-thick lumber to a rack and used the resulting tool to push the berries toward the pump opening. The use of the waterjet berry picker saves money for the grower because it reduces the need for labor by one worker. Photograph courtesy of the University of Wisconsin-Madison Department of Horticulture.

**Glass Fabrication With  
 Waterjet Cutting,** from page 17

pressure to insure the glass won't crack or break. The original non-Ingersoll-Rand nozzle assembly had problems creating enough pressure at the low end to properly pierce the start hole. Our solution was to switch to the genuine Ingersoll-Rand Autoline™ abrasive cutting nozzle assembly. The pre-aligned cartridge body, orifice and focusing tube produces the exact hydro abrasive stream which we find cuts faster than the other nozzles, consumes less abrasive and operates effectively at lower pressures."

**Waterjet Technology: The  
 Power of Water**

Two steps are required to produce the energy to cut materials with a waterjet. First, the intensifier, the heart of a waterjet cutting system, pressurizes water up to 55,000 psi (3800 bar). Second, the water is then focused through a small precious stone orifice and forms an intense cutting stream with a velocity of up to 2.5 times the speed of sound, depending on water pressure. Cutting harder materials like titanium, steel and others requires adding a fine mesh of abrasive garnet to the cutting stream. Abrasive garnet gets fed into the abrasive head mixing chamber to produce an abrasive jet stream during the cutting process.

At Nova, the nozzle configurations include an orifice with a .012-inch diameter. The Technicut abrasive waterjet cutting system used by Nova Classique is a Model JAS510-5. It consists of a positioning system and abrasive delivery system, the Streamline SL-IV waterjet intensifier and the fully-integrated high-performance N.C. Microproducts CAD/CAM software. There is an 80-inch by 130-inch clear cutting zone table/catcher tank with cutting speeds from .1 to 3,000 inches-per-minute. Machine accuracy is +/- .004 inches per axis. System repeatability is +/- .005 inches per axis.

The Ingersoll-Rand SL-IV 50 hp intensifier is a self-contained unit (see Figure 2) with built-in intelligent diagnostic features and pressure load auto balancing among its capabilities. It is a plunger pump using variable-displacement, pressure-compensated hydraulic pump technology to convert hydraulic pressure to 55,000 psi effective cutting pressure.

January 2001

"Ingersoll-Rand's pump and components are very reliable and predictable, requiring only limited maintenance," Vujcic says. "We are now able to have in place a preventative maintenance program, particularly for replacement of pump seals that optimizes our machine uptime."

Ingersoll-Rand invented waterjet cutting technology, and has been a leader for over 30 years in developing, building, applying and servicing complete waterjet cutting systems for customers throughout the world.

For more information, log on to [www.irco.com/waterjet](http://www.irco.com/waterjet) or contact Suzanne Perry, Ingersoll-Rand Waterjet Systems, 635 West 12<sup>th</sup> Street, Baxter Springs, KS 66713, phone: (800)826-9274, fax: (316)856-5050.



**Figure 2. Ingersoll-Rand Streamline™ SL-IV 50 hp waterjet intensifier delivers the optimum levels of component reliability and waterjet system uptime.**



WaterJet Technology Association's Order Form for Publications, Caps and Shirts

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_____ 8th & 9th Proceedings Set <b>SAVE \$45</b>	@	\$ 50.00	\$ 85.00	\$ 15.00	= \$ _____
BONUS: 6th and 7th Conference Proceedings included FREE!					
_____ Proceedings Of The 9th American Waterjet Conference (1997)	@	\$ 35.00	\$ 50.00	\$ 7.00	= \$ _____
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_____ Fluid Jet Technology — Fundamentals And Applications, Fourth Edition (1999) The "Short Course" Manual	@	\$ 55.00	\$ 70.00	\$ 6.00	= \$ _____
A limited supply of the 6th and 7th Conference Proceedings are available for the cost of shipping (varies depending on destination). Contact WJTA for details.					
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For shipping/handling charges outside the USA, contact the WJTA Office.

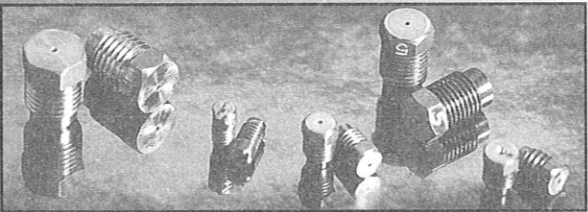
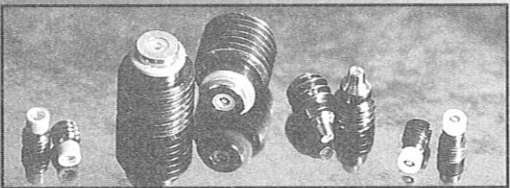
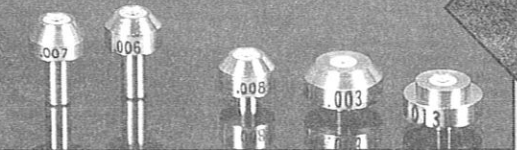
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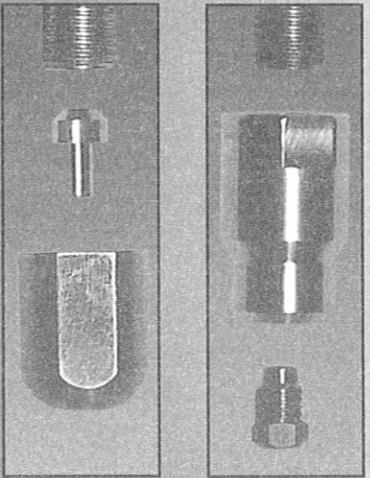
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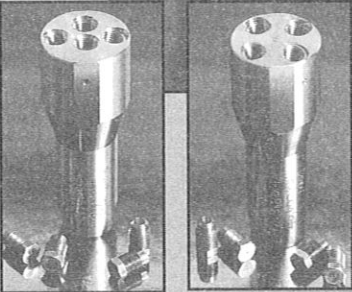
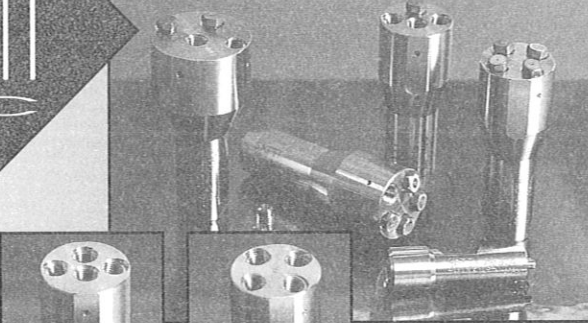
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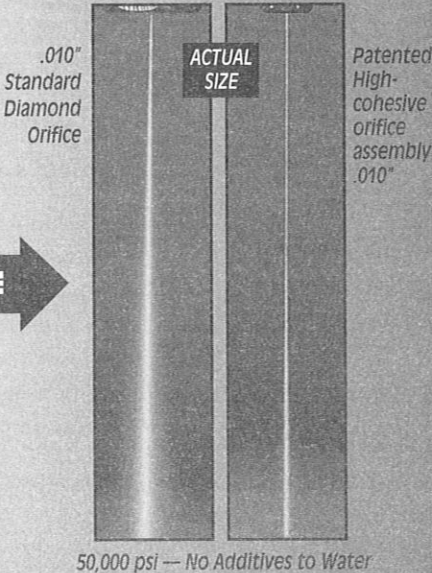
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## Waterjets Cut Tiles For Sarasota Airport Terminal



(1) Photograph courtesy of Crossville Porcelain Stone/USA.

Like airports the world over, the Sarasota Bradenton International Airport (SBIA) in Sarasota, Florida, is a high-stress environment that must take heavy traffic, rolling baggage and other noise sources in its stride. Looking to replace the airport's existing flooring, the Sarasota Manatee Airport Authority asked Tampa, Florida-based Kelly Taafe Design, Inc. (KTD, Inc.) to explore new options. The solution: 52,000 square feet of Crossville Porcelain Stone tile, of which approximately 40,000 square feet was cut with waterjet technology. "We wanted to be creative, yet needed durability and easy maintenance," says Kelly Taafe, project designer and firm

principal. "Crossville's vibrant colors and waterjet capabilities gave us unlimited design possibilities, while a 30-year life-cycle comparison between carpet and tile — along with Crossville's 30-year warranty — convinced the Authority to go with tile."

KTD, Inc.'s design intent was to use flooring as a tool to provide a warm, "Florida Beach" welcome to all travelers. Because this would be for many, their first introduction to Florida, KTD, Inc. wanted to emphasize the best of what the area has to offer — beautiful beaches and sea life.

### Taking the concept to the limit

Entering the airport on the first level, there is a central atrium complete with a two-story waterfall and fountain. An eye sore in the past because the chlorinated fountain water would unavoidably splash over the edge and bleach the carpet, it was also the one area that everyone entering or leaving the airport must pass. The main entrances flank the area and all traffic from the main stairs, escalators and

elevators filter down to this atrium. Through the use of porcelain stone tile, KTD, Inc. solved the maintenance problem and designed a work of art on the floor that will withstand the beating of heavy traffic. Here, the aquarium theme incorporates Sarasota's beloved manatee, a dolphin and tropical fish swimming on either side of a nautilus shell with seaweed twisting with the movement of the water on the ocean's floor.(1,2)



(2) Photograph courtesy of Crossville Porcelain Stone/USA.

(continued on page 10)

## Full-Time Students Invited To Apply For Complimentary Conference Registrations

The WaterJet Technology Association (WJTA) has available three (3) complimentary combo registrations for full time students who are also members of the WJTA at the time of application. The complimentary registrations are for the WJTA 2001 American Waterjet Conference to be held August 18-21, 2001, at the Hyatt Regency Minneapolis on Nicollet Mall in Minneapolis, Minnesota.

Each complimentary registration covers the pre-conference seminars, presentation sessions, party, tour and luncheons. It does not include room or travel. Applications will be taken up to April 18, 2001. Preference will be given first to students and then to other visitors traveling the furthest distance. The complimentary registrations will be awarded on or before May 18, 2001.

For more information, contact the WJTA office.

## Gloria Morgan Designated Official WJTA Conference Travel Agent

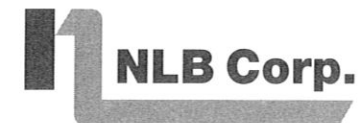
Gloria Morgan, St. Louis, Missouri, has been designated as the official travel agent for the 2001 WJTA American Waterjet Conference to be held August 18-21, 2001, at the Hyatt Regency Minneapolis on Nicollet Mall in Minneapolis, Minnesota. To make airline reservations, contact Gloria Morgan toll-free at 1-888-221-9042. If you are calling from St. Louis, Missouri, area codes 314 or 636, dial Gloria direct at 991-3563.

Be sure to mention that you are attending the 2001 WJTA American Waterjet Conference.



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## Waterjet Mosaics In Minneasota, from page 19

The Mosaics Project Coordinator was David Thorpe of the Architectural Alliance. The Twin Cities Metropolitan Airport Commission (MAC) commissioned the project. Funding for the waterjet cutting, installation, and artists parts of the project was provided by the Metropolitan Airports Foundation. The MAC paid for the Architectural Alliance.

Local artists were brought in through the Minnesota Arts Council, which solicited proposals statewide. Andrea Mikklebust and Stewart Turnquist were the artists whose design was chosen.

The stone cutting, done with waterjets, was managed by Pietrabella, where Tom Ferguson headed the job. David Thorpe praised Pietrabella highly: "They had a more than average sensitivity to what they were doing, they really worked hard to get it right." Again collaboration was the norm: Tile by Design supplied the materials, Fed Tech with Eric Chalmers functioned as the contract cutters, (using two cutting heads with .010 orifices and .030 nozzle, and flow rate of .5 gallon/minute each, and a 55,000 psi.), and finally Twin City Tile did the installation.

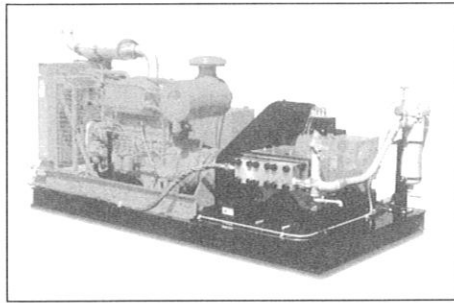
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## High Pressure Waterjet Pump

With a simple change of fluid end components, the rugged, new 13350D high-pressure water pump unit from NLB Corp. can be configured to operate at a variety of pressures and flows. The maximum pressure is 13,000 psi (900 bar) and the maximum flow is 74 gpm (279 lpm).



The unique, in-line fluid end design of the 13350D has fewer parts than other designs, increasing operating efficiency and greatly simplifying periodic maintenance. This design was previously available only in NLB pumps rated at 20,000 psi and 40,000 psi (1,400 bar and 2,800 bar).

NLB's 13350D is a triplex plunger pump that can be mounted on a steel skid or on a trailer, for easy transportation to job sites. Its six-cylinder diesel engine features a water-actuated throttle control that provides pumping power only when the operator needs it. The power and flexibility of the 13350D make it ideal for tank cleaning, multiple lance operations and many other applications. It is also available as an electric unit, the 13350E.

NLB manufactures a full line of quality waterjet systems and accessories for many uses, including industrial cleaning, surface preparation, tank cleaning, descaling, paint and product removal, concrete demolition, abrasive cutting, and more.

For more information, contact NLB Corp., 29830 Beck Road, Wixom, MI 48393-2824, phone: (248)624-5555; fax: (248)624-0908.

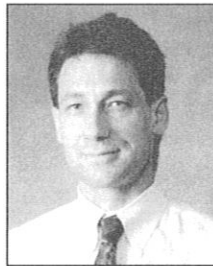
## ESAB Announces Personnel Changes

**Joe Blackmon III** has been named to the position of Marketing Manager. As marketing manager, Mr. Blackmon assumes responsibility for overseeing all facets of marketing and advertising for ESAB Cutting Systems' product lines. Blackmon, who holds a bachelor's degree in marketing and a master's degree in business administration from Francis Marion University, has worked for ESAB Cutting Systems since 1988. He previously held the positions of business manager, senior product manager, international product manager and senior buyer.



Joe Blackmon

**Jeff Defalco** has been named to the position of Product Manager for Machine Tools. Mr. Defalco will be responsible for overseeing all aspects of ESAB's laser, waterjet and Precision Plasma cutting systems.



Jeff Defalco

**Laura Kearns** has been named to the position of Manager, Machine Tool Sales. Ms. Kearns will be responsible for sales west of the Mississippi, with special focus on ESAB's Alpharex laser and Hydrocut waterjet product lines. According to Kearns, these product lines are showing tremendous growth in comparison to the traditional oxyfuel and plasma cutting machines.



Laura Kearns

**Jim Johnson** has been named Product Manager of ESAB Cutting Systems' Standard Products line. Mr. Johnson will oversee the marketing of the company's small to medium-sized mechanized cutting systems.



Jim Johnson

**Hal Lawrence** has been named to the new position of Product Manager, Cutting Tables and Environmental Equipment. Lawrence will oversee the development and production of cutting tables and environmental equipment used with ESAB gantry cutting systems.



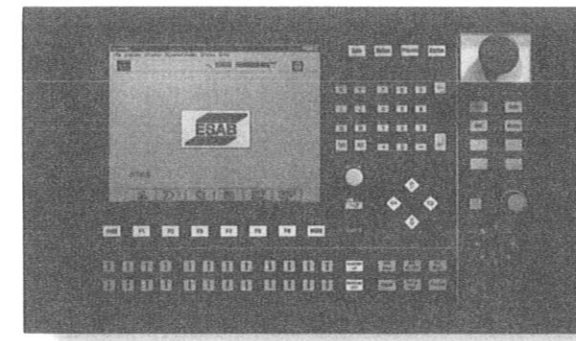
Hal Lawrence

ESAB Cutting Systems has named **Robert Scripnick** to the new position of Director, Machine Tool Sales. Mr. Scripnick will be responsible for sales of ESAB's specialty machines including the Alpharex laser and Hydrocut waterjet product lines. Mr. Scripnick previously served as marketing manager and as product manager for ESAB's gantry cutting systems.



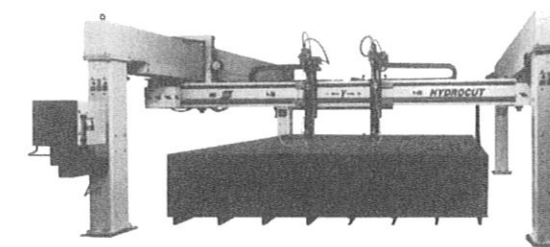
Robert Scripnick

For more information, contact ESAB Cutting Systems, phone: (843)664-4394, fax: (843)664-4403, web site: [www.esab.com](http://www.esab.com)



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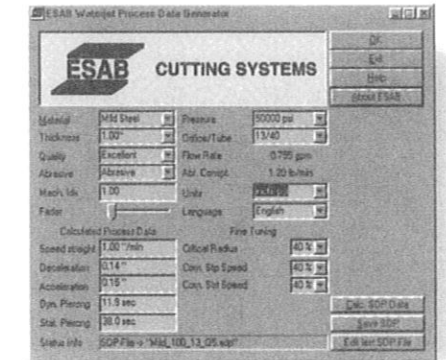


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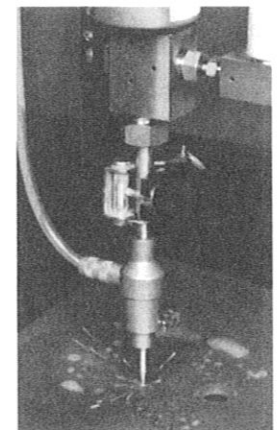
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## SUPER-WATER® Increases Waterjet Efficiency In Surface Preparation

By W. Glenn Howells and Ulrich Wilhelmi

SUPER-WATER® is a macro-molecular partially hydrolyzed (or anionic) polyacrylamide.

The technique described here has been successfully used over the past 25 years, but the first accurate quantitative assessment of this approach took place at Cairns, Queensland, Australia.

Tar epoxy and bad surface corrosion were removed from a deck on a tuna vessel at 15,000 psi, producing a WJ2 standard at 20 square meters per hour in three hours.

By comparison, based on extensive earlier experience, with plain water at 21,000 psi this takes five hours.

In a general sense a 0.3% solution of SUPER-WATER, when used in hydroblasting for surface preparation, allows use of lower pressure (15,000 psi) than with plain water (21,000 psi) and also provides a better surface finish.

For example, with SUPER-WATER at 15,000 psi one is able, with hand-held tools, to clean a large area at 15 square meters per hour while plain water at 21,000 psi cleans at only ten square meters per hour.

In part this is because of the higher flow rate of SUPER-WATER at eight gpm versus plain water at six gpm.

Additionally, the well documented drag reduction property of SUPER-WATER (equal to at least 50%) results in the nozzle pressure more closely matching the pump pressure (1). (This is especially advantageous when using long lengths of delivery tubing).

Drag reduction in combination with jet collimation and the macromolecular bombardment effect, discussed previously (1), also substantially improve performance.

Moreover, the blasting is easier to handle at lower pressures. SUPER-WATER has previously been shown to reduce pump operating and maintenance costs by 38% (2) and horsepower requirements by 31% (3).

All of these advantages more than compensate for the US\$48.00 per hour cost of the SUPER-WATER. (The cost is obtained from the following: 0.3% SUPER-WATER at US10 cents per gallon and eight gpm, i.e. 10 x 8 x 60 = 4800 cents).

An interesting consequence of this work derives from a requirement of the Australian Environmental Department to show that used SUPER-WATER was not harmful.

The safety and environmental considerations of SUPER-WATER have already been discussed (4) and the conclusions on its benign nature confirmed in applications worldwide.

The Australian Environmental Laboratories showed that after impacting a badly rusted steel surface the biological oxidation demand of 0.3% SUPER-WATER was reduced from 2700 mg/L to 200 mg/L.

Conditions were: 17,856 psi, flow 25 L/minute, standoff 2 - 3 inches. The fact that the surface was badly rusted, i.e. in a high oxidation state, makes this 13+ fold reduction even more significant.

(continued on page 14)

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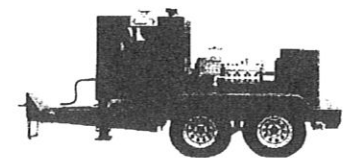
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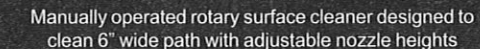
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8. Private communication to Berkeley Chemical Research, Inc., from Mr. Nathan Frost, Marino Engineering Company, Ypsilanti, Michigan. May, 2000.

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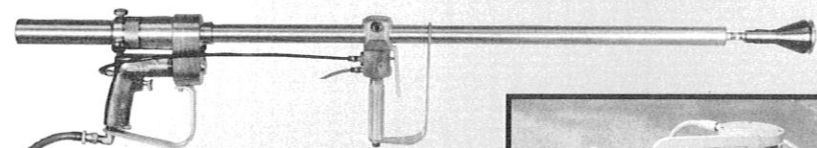
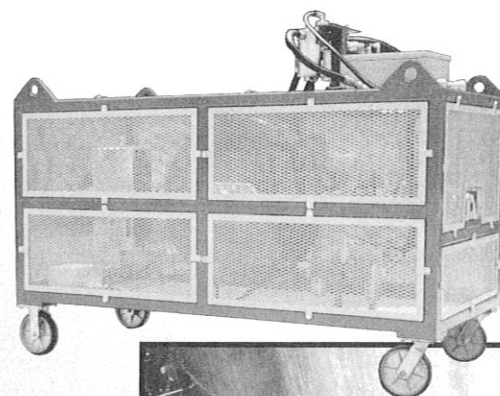
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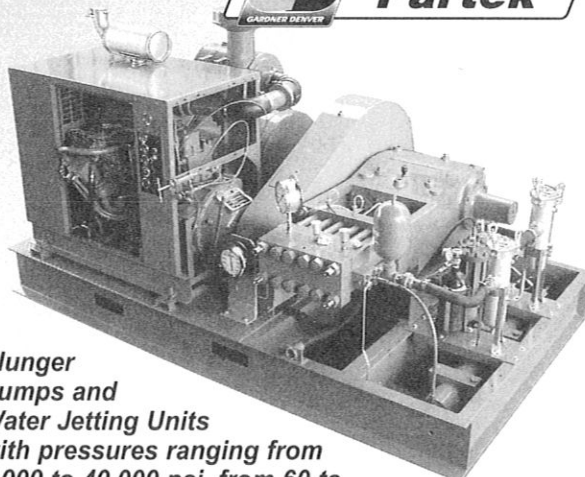
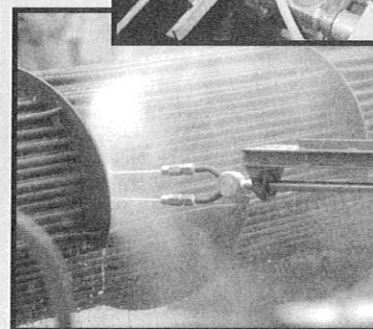
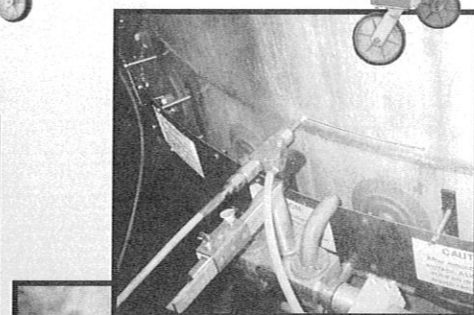
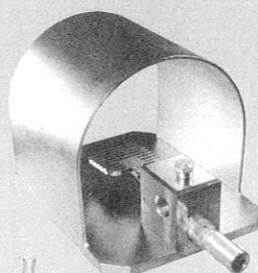
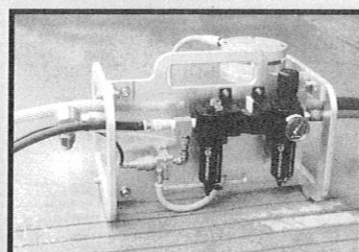
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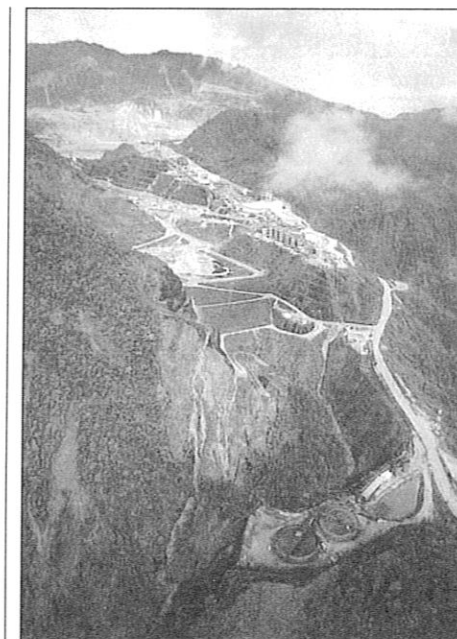
## Waterjetting In Papua, New Guinea

**K**T Plumbing Services (KTPS) was established as a stand alone company in 1994 from a multinational joint venture company which had been at the giant Ok Tedi Mining copper and gold project in Papua, New Guinea from its inception in 1981. From a company that specialized in industrial plumbing, KTPS has evolved into a varied service company supplying expertise in light engineering, sheet metal fabrication and installation, plant and equipment hire and the supply of training and certification personnel.

In 1996, the division KTPS-Multiblast Services, was specifically set up to provide a hydro blasting, dry grit blasting and industrial coating service to mining and heavy industries. Initially KTPS-Multiblast Services was only doing jobbing works for Ok Tedi Mining but this was expanded into regular programmed maintenance. Work undertaken with Ok Tedi includes hydro blasting the SAG Mill water feed pipe works (both feed and discharge), SAG Mill water loop mains, SAG Mill flash floatation suction and discharge pipes, all launder discharge pipes in flotation, column cells, various water mains, concentrate lines and various pieces of mobile equipment and fixed plant within the mine. Also currently we are hydro blasting, painting and steel refurbishing the floatation support structure.

Other projects successfully completed have been the hydro blasting of the water and fuel storage tanks, cleaning storm and sewer drains, hydro blasting and painting internally and externally fuel storage tanks at Kiunga, OTML's port facility.

With recent equipment purchases we are now expanding into numerous other mining and oil projects within Papua, New Guinea, and we are being



invited to participate in large projects in Indonesia.

Currently we have available equipment covering pressures from 4,000 psi to 20,000 psi with attachments to internally clean pipe work from 1 inch to 32 inches, along with the ability to internally coat the same from 6 inches to 32 inches, high pressure wet grit accessories and the ability to paint large surface areas with our multi-gun airless paint units.

### Ok Tedi Mining and Papua, New Guinea

For a country of slightly more than 463,000 square kilometers, Papua, New Guinea harbors extraordinary biological and cultural diversity with 80 per cent of the original rain forest cover remaining. PNG's cultural diversity is characterized by the fact that over 800 distinct languages are spoken among its four million people. The combination of Papua, New Guinea's impressive plant and animal diversity, its unmatched cultural diversity and the intact condition of a large percentage of its natural

ecosystems and human cultures make this young nation one of the most interesting in the world today. In fact one of the last known remote village groups in the world to encounter contact from the modern world for the first time in 1982 was in the dense jungle and mountainous region in which the Ok Tedi Mine is located.

Ok Tedi is of great importance to Papua, New Guinea, providing near 20% of foreign exchange earnings, and dependant on the relative metal and oil prices, anything up to 10% of GDP, as well as extensive employment and training. Eighty-six million tons of material is mined each year, 235,000 tons each day, from which is produced 550,000 tons of concentrate containing 400 million pounds of copper, and at least 500,000 ounces of gold. The geotechnical setting of Ok Tedi (which means River Tedi), is characterized by remoteness, rugged terrain, geotechnical instability, and very high rainfall, over ten meters a year at mine site.

The remoteness of the mine site is characterized by the fact that all supply is via the meandering 800km long Fly River to the inland port town of Kiunga, which is only 460km as the crow flies from the river's mouth. A 150 km road links Kiunga to the mining township of Tabubil which also has an airstrip capable of receiving aircraft up to the size of the Hercules which it had to depend on heavily during the drought of 97/98 when the Fly River all but dried up. During this period the river was reduced to a flow level too small for the 3,000 ton supply ships to navigate compared to normal flows from a river that on an average day the equivalent of 5/8ths of the total water runoff from the continent of Australia is discharged from its 5km wide river mouth.



A New Book: Industrial Cleaning Technology

By: Joe Harrington, Process Cleaning Technology

Industrial Cleaning Technology contains a comprehensive review of current industrial cleaning techniques, including those using traditional low, medium and high pressure water, solvents, chemical compounds and foam, wet and soluble abrasives, 'pigging devices', biotechnology processes and the latest computerized 'state of the art' in-line automatic techniques. Emphasis is firmly placed on the practical aspects of designing, manufacturing and operating cleaning equipment and systems.

Industrial cleaning applications include: Municipal drains and sewers, road tanker and container depots, chemical and petrochemical plants, offshore oil and gas platforms, paper mills, paint and similar manufacturing processes, IBC and drum cleaning systems, pharmaceutical, biotech and cosmetic plants, food processing, marine, drydock and nuclear plant decontamination projects, together with a selection of case studies relating to typical industrial cleaning problems and injuries associated with high pressure water jetting activities.

In addition to actual techniques, the book examines the increasing effect of international health, safety, training and environmental legislation on cleaning activities, with particular reference to European Directives, the United States and regulations controlling cleaning standards, procedures and plant designs in the pharmaceutical and food processing industries.

Useful information sources are listed throughout the book.

The hardcover book is available for US\$120 plus postage. However, for a limited period (replies must be received by March 31, 2001), there will be a 30% discount. Order code is ISBN 0-7923-6748-0.

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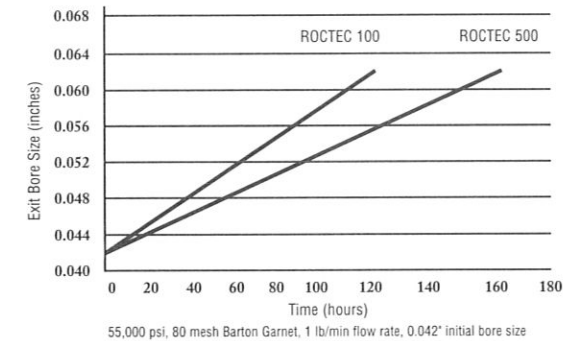
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WJTA Safety Cards

The WJTA, in cooperation with Dr. Eugenia Cheng of the Department of Occupational Medicine, University of Illinois at Chicago, has prepared a safety card containing valuable medical information in the event a worker is injured during the course of a waterjetting project. All individuals involved in waterjet projects are encouraged to carry the safety card.

The card contains suggestions for dealing with an injury as well as important information for the attending physician.

The wallet size cards are laminated and printed in black and orange. Each WJTA member is receiving one complimentary copy of the safety card. Your card is enclosed with this issue of *Jet News*. Use the order form here to obtain additional cards.

January 2001

**WJTA Safety Cards Order Form**

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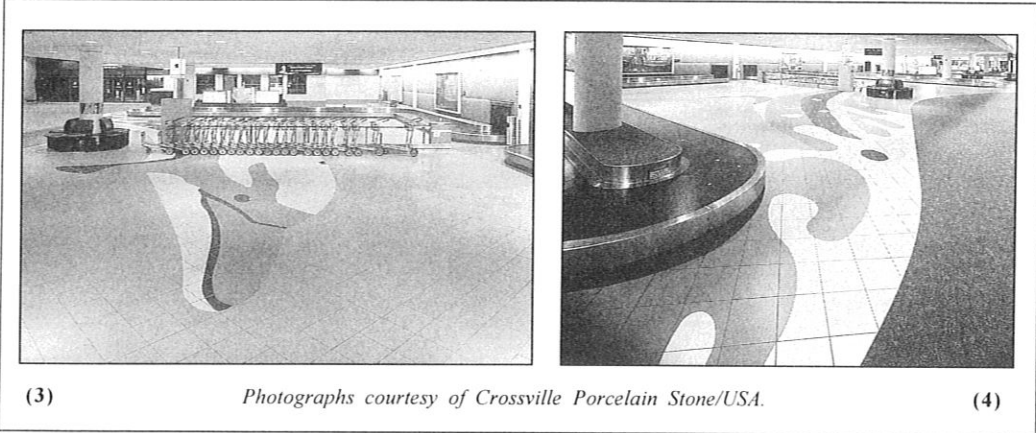
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Jet News

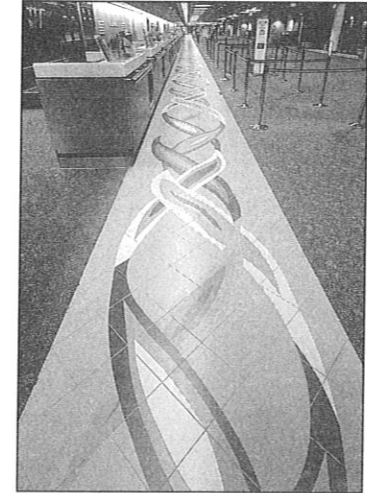




Along the Ticket Counters to the east of the fountain, a braided strip of seaweed seems to undulate as the tiles subtly change color within each strand of seaweed.(5) An elegant image, the seaweed delineates where the queuing lines end and service begins.

(continued on page 11)

Heading west to Baggage Claim, a group of larger-than-life dolphins splash in and out of crystal blue water.(3) A wave design, echoing the movement of the ocean, serves as the transition between carpet and tile.(4) As one's eye follows along the floor to the north wall, a random sprinkling of terra rosatta-colored tiles suggests the sun shimmering on the water — the spot where the ocean meets the horizon. And beyond the art of the floor, porcelain stone tile provided a practical solution since the flooring in Baggage Claim areas is notorious for taking a beating from concentrated traffic, the banging and rolling of luggage and lots of spills.



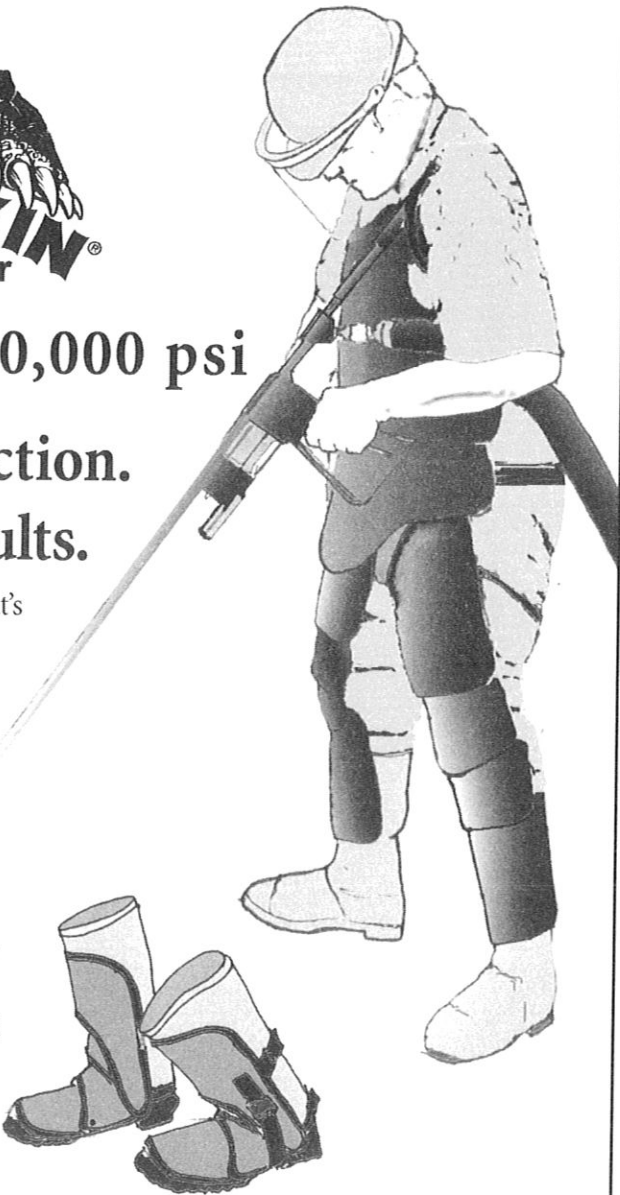
(5) Photograph courtesy of Crossville Porcelain Stone/USA.



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## Waterjet Mosaics In Minnesota

Waterjetters arriving at Minneapolis/St. Paul International Airport for the 11<sup>th</sup> American Waterjet Conference, August 18-21, 2001, will see three new mosaics in the floor of the main thoroughfare of the airport. The mosaics, shown in Figures 1, 2 and 3, were cut using waterjet technology.

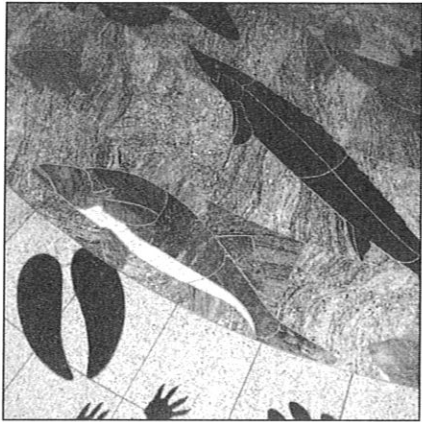


Figure 1. *Plant/Animal Season.* This mosaic celebrates Minnesota wildlife. Photo courtesy of Architectural Alliance.

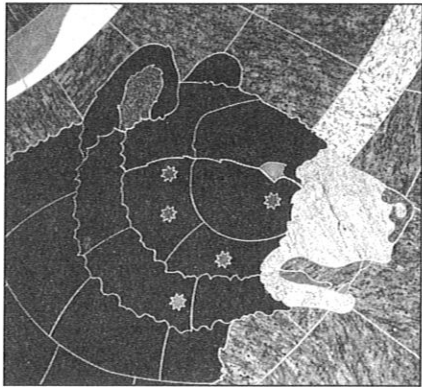


Figure 2. *The North Star.* This mosaic refers to Minnesota's status as the "North Star State." Photo courtesy of Architectural Alliance.



Figure 3. *Minnesota Compass Rose.* This mosaic, set with a Northern red oak leaf, orien-tates the traveler. Photo courtesy of Architectural Alliance.

An unusual collaboration of organizations, people and talents created these Waterjet Mosaics.

(continued on page 25)



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# Candidates Sought For 2001 WJTA Awards

You are invited to submit candidates for these special awards that are presented biennially by the WaterJet Technology Association to honor a company, organization or individual who has made a significant contribution to the industry through accomplishments that directly enhance waterjet technology and the industry as a whole. A list of previous WJTA award recipients appears at the right of this sheet.

**Candidates must be received no later than July 2, 2001.** The award recipient, to be selected by the Awards Committee of the WaterJet Technology Association, will be honored at a presentation ceremony on Monday, August 20, 2001, in conjunction with the 2001 WJTA American Waterjet Conference in Minneapolis, Minnesota.

Following is an official form for candidate nominations. Complete one form for each nomination submitted. Please make additional copies of the form as needed. Nominations providing complete written information specified on the form may be faxed to (314)241-1449 or mailed to the WaterJet Technology Association, 917 Locust Street, Suite 1100, St. Louis, MO 63101-1419, USA.

## Previous Award Recipients

1981	Pioneer Award	Jacob Frank (deceased)
1983	Pioneer Award	H.D Stephens (deceased)
1985	Pioneer Award	William Cooley, Fairfax, VA
1987	Pioneer Award	Norman Franz, Ph.D., Vancouver, BC
1989	Pioneer Award	Richard Paseman, Houston, TX
1991	Pioneer Award	John H. Olsen, Ph.D., Auburn, WA
1993	Pioneer Award	Fun-Den Wang, Ph.D., Golden, CO
	Safety Award	David Summers, Ph.D. NLB Corporation
	Service Award	George A. Savanick, Ph.D. Mohan Vijay, Ph.D.
	Technology Award	Mohamed Hashish, Ph.D. Autoclave Engineers Hammelmann Corporation
1995	Pioneer Award	George Rankin, Houston, TX
	Safety Award	Autoclave Engineers
	Service Award	Thomas J. Labus
	Technology Award	Thomas J. Kim, Ph.D.
1997	Pioneer Award	David A. Summers, Ph.D., Rolla, MO
	Service Award	Andrew F. Conn, Ph.D.
	Technology Award	Prof. Dr-Ing. Hartmut Louis
1999	Pioneer Award	Mohamed Hashish, Ph.D., Kent, WA
	Safety Award	Bruce Wood
	Service Award	John Wolgamott
	Technology Award	Ryoji Kobayashi, Ph.D.

## 2001 WJTA Awards Nomination Form

**Instructions:** Complete sections below and submit a narrative (300-word maximum) to support your nomination on a separate sheet of paper. Please print or type all information.

I nominate the following company, organization, or person as a candidate to receive a 2001 WJTA Award

(CHECK ONE AWARD):

### ☐ Distinguished Pioneer Award

The nominee must:

- Have made contributions to the waterjet industry;
- Have made contributions to the achievement of the goals of WJTA;
- Have high moral character;
- Have strong personal and business ethics;
- Be dedicated to the future of the waterjet industry and to the growth of WJTA.

### ☐ Service Award

How has the nominated company, organization or individual contributed in time and talent toward improvement in the WaterJet Technology Association?

### ☐ Technology Award

What has the nominated company, organization or individual done to introduce new and innovative ideas in engineering or manufacturing? This could include, but is not limited to, new products, new manufacturing techniques, patents . . . any unique activity that advanced the technology of the waterjet industry.

### ☐ Safety Award

What has the nominated company, organization or individual done to introduce new and innovative ideas in safety? This could include, but is not limited to new products, new concepts, new safety techniques . . . any unique activity which increases the overall safety of waterjet equipment.

(nominations form on page 22)

## Waterjets Cut Tiles For Sarasota Airport Terminal, from page 10



(6) Photograph courtesy of Crossville Porcelain Stone/USA.

Upstairs is Security, another highly concentrated traffic area, where travelers now walk over an enormous, lifelike nautilus shell made of tiles from Crossville's Veranda Stone Collection.(6) KTD, Inc. used the natural colors of botticino, toscana brick and madras for the shell and then defined the shell's dimensional shape with a ridged tile edging of polished ebony. Three strands of seaweed — moving on a field of terra rosetta tile — come up to meet the nautilus before undulating down a 30-foot-wide x 600-foot-long concourse; the seaweed serving as a "yellow brick road" to help passengers reach their gates. One strand combines rich blues — Adriatic blue, lapis, windsurf and sea mist; another incorporates greens — cypress green bayberry, green briar and veridian; and the third is made up of bold colors like ebony, graphite and mica.(7)



(7) Photograph courtesy of Crossville Porcelain Stone/USA.

## Reducing noise

Through the airport, tile provided a spectacular design and durability solution yet a concern of the Airport Authority was noise — from people, roller baggage, planes and other outdoor sources. "A noise transference material was specified to be installed between the substrate and the tile to cut down on outside noise and to help with acoustics, says Taaffe. "But the problem still remained with the use of roller baggage. How could we prevent this?" KTD, Inc. worked closely with Crossville, Intercoastal Distributors, and Carpet Services of Tampa to create an installation with an average grout joint of 1/8 inch in the field tile and an average of 1/16 inch within the waterjet cut pattern. "This was a real challenge," says Doug Mahoney, district manager of Intercoastal Distributors of Tampa, "considering the amount of floor space involved and the varying condition of the slab beneath. In the end, noise reduction requirements exceeded industry standards and roller baggage is virtually inaudible."

During the project, Crossville and Intercoastal Distributors managed the process from the receipt of the design — ensuring that the design worked within the gridwork pattern; overseeing the waterjet cutting; mounting, packing and shipping the tiles; and providing the contractor with CAD drawings and directions. Few tile manufactures and distributors are able to provide this value-added service.

Any airport can be a stressful environment. KTD, Inc.'s goal was to create a positive, maintainable "distraction" that would suggest natural way-finding routes for passengers, while supplying the Airport Authority with a 30-year solution to a high-traffic challenge. Sarasota Bradenton International Airport now has it all — including a unique tile

flooring design that makes the airport itself a destination.

Kelly Taaffe Design, Inc. is an award-winning design firm specializing in commercial high-traffic projects nationally and internationally. Based in Tampa, Florida, the firm is celebrating 17 years of dedicated service to an impressively varied list of clients; project types include airport facilities, commercial high-rise buildings, convention complexes, housing facilities, retail and hospitality projects. For more information, contact (813)254-4507 or e-mail KTDDesign@Juno.com.

Founded in 1986, Crossville Porcelain Stone/USA is the largest domestic manufacturer of porcelain stone tile for both residential and contract applications. The company's mission statement is "To Create Excellent Value in Porcelain Tile for Our Customers." For more information, contact Crossville Porcelain Stone/USA at (931)484-2110 or visit [www.crossville-ceramics.com](http://www.crossville-ceramics.com).

Ever conscious of environmental conservation, all flooring replaced by this renovation was recycled through a reclamation program.

## Sarasota Bradenton International Airport Project Sources

**Client:** Sarasota Manatee Airport Authority, 6000 Airport Circle, Sarasota, FL 34243-2105, phone: (941)359-5200, fax: (941)351-8264; **Design Team:** Kelly Taaffe Design Inc., Kelly Taaffe, Principal, Nicole Malone, Design, Tony Jen, Design, 1423 S. Howard Avenue, Tampa, FL 33606, phone: (813)254-4507; fax: (813)254-5105, e-mail: KTDDesign@Juno.com; **Tile Manufacturer:** Crossville Porcelain Stone/USA, Jim Dougherty, VP, Marketing and Business Dev., phone: (931)484-2110, Frank Douglas, Regional Manager, phone: (561)790-2290, PO Box 1168, Crossville, TN 38557, phone: (931)484-2110, fax: (931)456-3993, web site: [www.crossville-ceramics.com](http://www.crossville-ceramics.com); **Tile Distributor:** Doug Mahoney, District Manager, Intercoastal Distributors, 7715 Anderson Road, Tampa, FL 33634, phone: (813)884-8453, fax: (813)888-4956; **Tile Contractor:** Carpet Services of Tampa, 1101 North Ward Street, Tampa, FL 33607, phone: (813)286-5444, fax: (813)281-0865.



# Nominations Open For WJTA Board Of Directors

"Nominations for the WaterJet Technology Association (WJTA) Board of Directors are now open," announced Dr. Andrew Conn, secretary of the WaterJet Technology Association.

"The WaterJet Technology Association is growing rapidly, and the Association needs dedicated directors to lead the members as the WJTA grows," says Dr. Conn, who is also chairman of the Committee on Nomination. "The duties of the directors are truly challenging and rewarding."

The four-year terms of office of Andrew F. Conn, Ph.D., Mohamed Hashish, Ph.D., George A. Savanick, Ph.D., David A. Summers, Ph.D., and Mohan M. Vijay, Ph.D. will expire on August 19, 2001. Terms of office for Brian Roach and Randy Kruger will also expire on August 19, 2001. Therefore, nominations are sought for seven (7) board members, each to serve a four-year term of office beginning August 19, 2001.

According to the WJTA bylaws, each of the above-named individuals are eligible for re-nomination and re-election to the WJTA Board of Directors.

With regard to all first-time nominees, the WJTA bylaws provide that no more than one of the elected board members may be from the same company or organization. Therefore, board members may not be nominated from facilities that are already represented on the board by individuals whose terms expire in 2003. These facilities include: Advisory Council (Lydia M. Frenzel, Ph.D.), High Pressure Equipment Company (Larry Loper), HydroChem Industrial Services, Inc. (Pat DeBusk), NLB Corporation (Forrest Shook), and StoneAge (John Wolgamott).

According to the WJTA bylaws, any WJTA member in good standing (2001 membership dues paid) may submit a nomination(s). Nominees must also be WJTA members in good standing. The deadline for making nominations is at least eleven (11) weeks prior to the biennial business meeting scheduled for Sunday, August 19. Your nomination(s) should reach the WJTA office no later than **May 17, 2001**. To submit a nomination(s), complete the form below and return to:

Chairman, Committee On Nomination  
WaterJet Technology Association  
917 Locust Street, Suite 1100  
St. Louis, MO 63101-1419  
Phone (314)241-1445  
Fax (314)241-1449

**Remember, nominations must be received no later than May 17, 2001.**

## Nominations/Elections Procedures

In accordance with the bylaws of the WaterJet Technology Association, revised in 1993, nominations and elections to the Board of Directors include the following procedures:

- At least two calls for nominations to the board of directors will be published in the *Jet News*. The first call for nominations appears in this issue. Nominations will be accepted through May 17, 2001.
- A list of the eligible nominees and a brief biographical sketch for each individual will be published in the June 2001 issue of *Jet News*.
- An official ballot listing the eligible nominees will then be forwarded by mail to all eligible voting members of the Association on July 2, 2001. Signed and executed, ballots must be mailed to the Association's office for tallying by August 11, 2001.
- The names of newly elected board members will be announced on Sunday, August 19, 2001, at the WJTA general membership meeting held in conjunction with the 2001 WJTA American Waterjet Conference in Minneapolis, Minnesota.

Only eligible members of the WaterJet Technology Association may submit a nomination and nominees must be eligible members of the WaterJet Technology Association.



## Nomination Form

Name Of Nominee \_\_\_\_\_ Title \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

Country \_\_\_\_\_ Postal Code \_\_\_\_\_

Telephone \_\_\_\_\_

In US/Can (\_\_\_\_\_) \_\_\_\_\_ Outside US/Can [\_\_\_\_\_] (\_\_\_\_\_) \_\_\_\_\_  
(area code) (country code) (city code)

Fax \_\_\_\_\_

In US/Can (\_\_\_\_\_) \_\_\_\_\_ Outside US/Can [\_\_\_\_\_] (\_\_\_\_\_) \_\_\_\_\_  
(area code) (country code) (city code)

*Attach biographical information with a brief statement of your nominee's mission and vision for WJTA.*

Name Of Nominator \_\_\_\_\_ Title \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

Country \_\_\_\_\_ Postal Code \_\_\_\_\_

Telephone \_\_\_\_\_

In US/Can (\_\_\_\_\_) \_\_\_\_\_ Outside US/Can [\_\_\_\_\_] (\_\_\_\_\_) \_\_\_\_\_  
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## Glass Fabrication With Waterjet Cutting

Waterjet technology extends one company's ability to produce intricate and complicated glass shapes for all types of glass fabrication.

Nova Classique Glass Industries Inc. in Downsview, Ontario, Canada began using CNC waterjet cutting equipment about three years ago to enhance their ability to create and produce intricate and unique glass designs from three-dimensional and flat sculptures to glass furniture and special glass architectural accessories (see Figure 1). Although Nova still found the efficiency of its conventional diamond knives valuable for many jobs, the company decided to purchase a waterjet cutting system, enabling them to produce more precise complicated shapes in a wider variety of glass types as well as related granites and marbles. With CNC capability, Nova is able to take CAD files from the customer and easily create the necessary programming to produce the intricate shapes.

Goran Vujcic, Nova's chief programming specialist says, "There's no question that waterjet cutting provides the precision cutting needed to create many of the complex shapes and unique requirements of our products. Combined with our CNC diamond polishing, it allows tremendous flexibility in manufacturing and extends the possibilities for all of our types of glass fabrications, including bent and laminated glass."

Vujcic adds, "Because waterjet technology was a new manufacturing process for us, we have progressed through a learning curve that we are now comfortable with. For example, we originally selected a Technicut JA510-A CNC abrasive waterjet cutting system with dual cutting heads. We felt that

this machine provided the needed capacity, speed, accuracy and low maintenance. The system specifically featured an Ingersoll-Rand SL-IV 50 hp intensifier, abrasive delivery and metering assembly." The original cutting heads, however, were not supplied by Ingersoll-Rand.

"What we initially found, Vujcic says, is that piercing a start hole in specialty glass requires lower initial

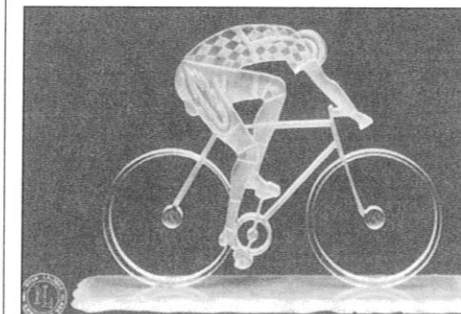


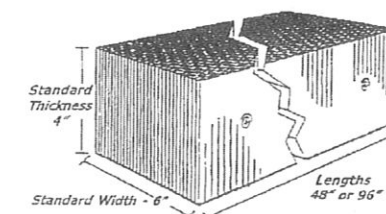
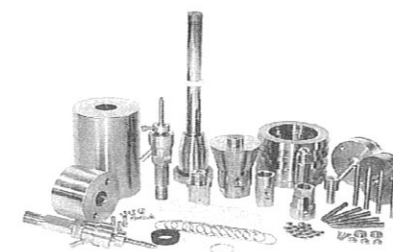
Figure 1. Typical intricate glass products produced by Nova Classique Glass Industries, Inc. in Downsview, Ontario, Canada.

(continued on page 27)

# FEDTECH

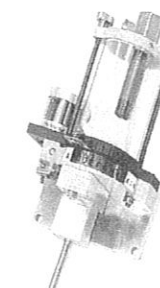
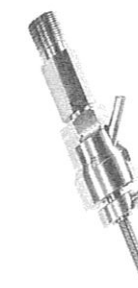
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## WOMA Database On Waterjet Technology

**W**OMA Apparatebau GmbH, a leading manufacturer of high-pressure water equipment, offers an on-line database about recent developments in waterjet technology. The database includes new trends in technical equipment, such as ultra-high pressure pumps, water tools, valve design, accessories, as well as interesting field applications. The latter part covers site stories from many industrial areas, among others concrete hydrodemolition, pipe cleaning, surface preparation, hydroblasting, on-site demolition, recycling, hot waterjetting and jet cutting. The very unique database can be entered by public users without any restrictions under "[www.woma.de/news1.htm](http://www.woma.de/news1.htm)."



### WJTA Administration

**Chairman of the Board**  
John Wolgamott  
(970)259-2869

**President/Jet News Editor**  
George A. Savanick, Ph.D.  
(952)432-7594

**Vice-President**  
Lydia M. Frenzel, Ph.D.  
(512)392-2210

**Secretary**  
Andrew F. Conn, Ph.D.  
(410)532-3452

**Treasurer**  
Larry Loper  
(800)289-7447

#### 1999-2001 Directors

Pat DeBusk (713)393-5600	Forrest Shook (248)624-5555
Mohamed Hashish, Ph.D. (253)850-3500	David Summers, Ph.D. (573)341-4314
Randy Kruger (713)307-2140	Mohan Vijay, Ph.D. (613)993-2731
Brian Roach (909)350-4054	

#### Emeritus Members

Thomas J. Kim, Ph.D. (401)874-2186	Thomas J. Labus (414)275-5572
Fun-Den Wang, Ph.D. (303)279-9415	

#### Association Managers

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

## A New 3D Nozzle For Vessel Cleaning

**S**toneAge Inc. has developed a new 3D nozzle for waterblast cleaning of reactors, tanks, and other vessels. The CyClean 3D is rated at 20,000 psi, and up to 40 gpm, or 465 HP. It's compact spherical shape allows the CyClean 3D to fit through 7-inch-diameter ports. The tough polyurethane spherical cover protects rotating nozzle arms from damage, without the use of a separate cage. High pressure seals are leak -free, inexpensive and easy to replace when worn out. It is easy to handle, one of the lightest weight 3D nozzles available at only 23 lb. Finally, the CyClean 3D can accommodate pumps from 40 to 465 HP with a simple adjustment to the nozzle arms, and replacing the jets.



3D cleaning at 20,000 psi makes sense for two reasons. First, since so many contractors use 20,000 psi pumps, it is no longer necessary to provide overpressure protection at a level substantially below that for the pump. Secondly, since vessel cleaning requires waterjet power to be projected over a great distance, the 20,000 psi jets can tolerate more power loss to turbulence at the water/air interface than a lower pressure jet and still deliver excellent cleaning results.

More and more contractors are buying 3D nozzles to avoid the precautions necessary when people must enter a vessel. OSHA Regulation Title 29 CFR 1910.146 protects workers who enter confined spaces from asphyxiation, and other

hazards of an environment not normally safe for people to work in. Similar regulations have been adopted by other countries. These are common sense rules requiring that all sources of hazardous materials, powered equipment, and inert blankets be isolated from the vessel before entry. Adequate ventilation must be assured, with back up provisions. Furthermore, rescue equipment and personnel are required in case workers are overcome by hazardous materials

or inadequate breathing air. Training of workers must be completed and documented. The precautions save lives and are really important for contractors who do this type of work. They are expensive though, making it wise to avoid vessel entry

whenever possible. The CyClean 3D nozzle can often eliminate vessel entry, and complete the job more thoroughly, with less down-time.

The typical large petrochemical operation or refinery loses as much as \$15,000/hour sales when shut down. So the incentives are great to complete turnaround work on or before schedule. Contractors with a good 3D nozzle like the CyClean 3D can do the job in less time which makes their service considerably more valuable.

For more information, contact StoneAge Waterjet Tools, 54 Girard Street, Durango, CO 81301, phone: 970-259-2869, web: [www.stoneagetools.com](http://www.stoneagetools.com), fax: 970-259-2868.

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\* Accuracy measured on 3030AMC Dual Drive by a Renishaw® Ballbar.





Also with reference to the general benign environmental impact of anionic polyacryla-mides, it is important to point out they are now being used extensively in agriculture.

One of the authors coordinated a research program between universities and industrial companies (5) on soil conditioners and therefore it is interesting to note that high molecular weight linear anionically charged polyacrylamides (a category that includes SUPER-WATER) have now received widespread approval as soil conditioners in much of the western U.S.A.

Since 1995 over 200 papers have been published on this application and it has been described "as possibly the most successful soil conservation practice ever developed for furrow irrigation." In 1997 over 600,000 acres were treated in the U.S.A.

The potency of SUPER-WATER in removing surface material has independently been reported (6).

Using a WOMA pump, operating at 10,800 psi with a cylindrical nozzle of 1 mm diameter, plain water removed 0.80 cubic mm of stainless steel in 1 minute from a planar surface held normal to the jet, at a standoff distance of 1 meter.

Under identical conditions 0.3% SUPER-WATER in 1 minute removed 60.6 cubic mm of stainless steel. This 76-fold increase was determined using a Laser Optical Measuring Device which describes surfaces in steps of 8 micrometers.

The capability of SUPER-WATER to have a significant impact upon metallic substrates without assistance

from abrasives has been reported earlier.

For example during removal of magnetite/metallic copper and oxides of copper compressive strength 15,000 psi) from the tube sheets of nuclear power steam generators at the Ontario Hydro Bruce Nuclear Power Plant it was noted that a 0.3% solution of SUPER-WATER at a pressure of 8,500 psi cut through the Monel-400 tubes in about five minutes (7).

More recently, using ultra-high pressure commercial cutting equipment, it has been shown that either a 0.2 or 0.3% solution of SUPER-WATER cuts steel shim stock (thickness 0.02 to 0.030 inch) without abrasive (8).

This ability to cut metals is the basis for the term "soluble abrasive" used by AQUAPREP Pty. Ltd.

Other applications in Australia, which parallel those conducted with SUPER-WATER elsewhere throughout the world, will be detailed in future communications.

W. Glenn Howells, Ph.D.  
Berkeley  
Chemical  
Research, Inc.,

Berkeley, California, U.S.A.  
<http://www.berkeleychemical.com>

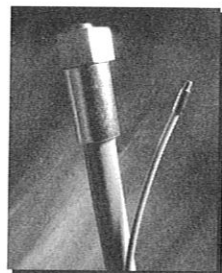
Ulrich Wilhelmi  
AQUAPREP Pty. Ltd., Cairns,  
Queensland, Australia  
<http://www.aquaprep.com.au>

#### References

1. W.G. Howells, "Polymerblasting with SUPER-WATER from 1974-1989: a Review," International Journal of Waterjet Technology, Volume 1, Number 1, (March 1990), pp. 1-16.
2. R. Lombardi, "Ultra-High Pressure Non-Abrasive Polymer Jetting: a Production Implementation," Proceedings of the 9th

(continued on page 22)

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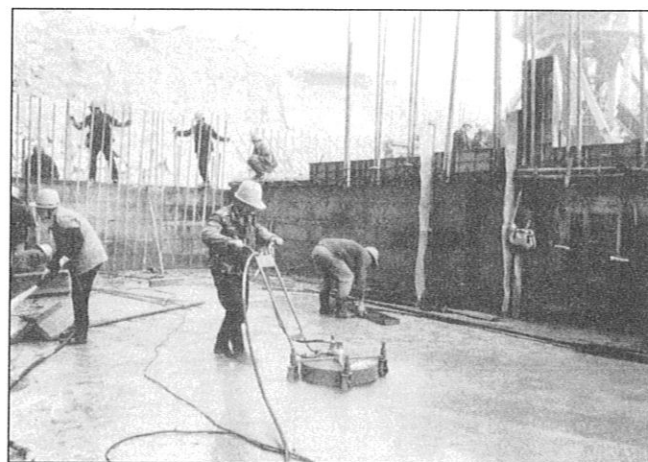
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## Waterjets At The World's Largest Water Project In China

The Three Gorges Dam Project at the Yangtze River is the largest water conservation project ever run in the world. With normal pool level at 175 meters, the total storage capacity of the reservoir will be 39.3 billion m<sup>3</sup>. The project is composed of a dam, two power plants and navigation facilities.

The total length of the dam is 2,310 meters, with the crest elevation at 185 meters and a maximum height of 175 meters.

For erecting just the dam structure, including power stations, navigation facilities and diversion works, an entire amount of about 27.1 million m<sup>3</sup> concrete will be placed, reinforced by 354,300 tons of steel.



Joint cleaning with WOMA's high-pressure waterjet technology.

Major concrete placing work has been done at the left bank of the dam, and the shiplock that is part of the navigation facilities. Because of the mass-concrete character of the placing, a layer-by-layer method needs to be used for the concreting. The

problem of cleaning the concrete joints between the layers was solved by high-pressure waterjetting.

WOMA's high-pressure unites type 1502, driven by diesel engines, are located at the construction site. The operating pressure is 600 bar with a corresponding water volume flow rate of 80 liters per minute. Exclusively developed floor cleaners that comprise a rotating nozzle bar are used for the cleaning and roughening work.

This technology is also used at several dam projects at the Yellow River further north in China. For example, at the Xiao Lang Di Multipurpose Dam Project, five 1502-units are permanently run.

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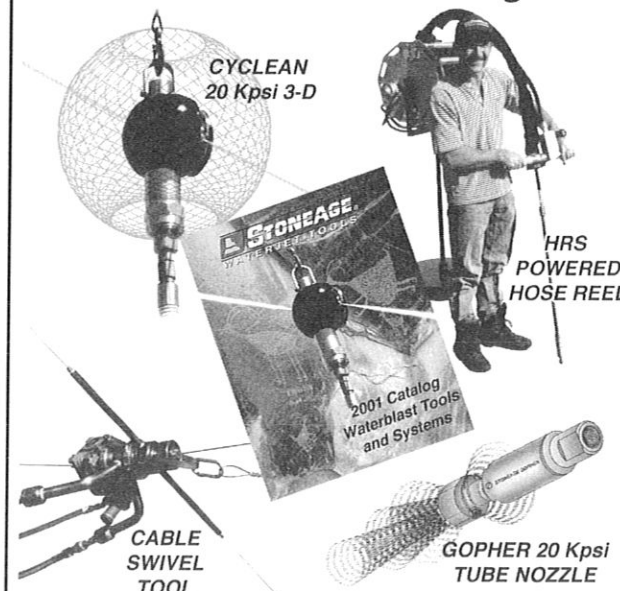
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