ultrasonic industry association
UIA

Vibrations

News from the Ultrasonic Industry Association

Jeff Vaitekunas, Editor

Summer 2001, Vol. 11, No. 2

31st Annual Ultrasonic Industry Association Symposium
The Omni Hotel ~ Atlanta, GA ~ October 10-12, 2001
Immediately following the IEEE-UFFC meeting

Papers are being presented in four technical areas:

SONICALLY-ENHANCED PROCESSING SESSION

- Description and Preliminary Evalution of a New Ultrasonic Atomizer for Spray-Congealing Processes - Baesi Giampierto
- Sonochemical Desorption and Destruction of 4-chlorobiphenyl from Synthetic Sediments - Linda Weavers
- Ultrasonic Cleaning in Liquid and Sepercritical CO_2 - Miodrag Prikic
- On Mechanics of High-G Transformation of Materials with Ultrasonics - Naga Senapati

HIGH POWER APPLICATIONS SESSION

- Microstructural Characterization of Ultrasonically Welding Aluminum Joints - Oludele Popoola
- The Implications of Fundamental Formulas for Frequency Selection in Ultrasonic Plastics Welding - Thomas R. Kirkland
- Ultrasonic Complex Vibration Welding Systems with Large Area Welding Tips for Packaging in Microelectronics - Jiromaru Tsujino
- Best Practices for Automotive Ultrasonic Welding of Aluminum - Jan Skogsmo

INDUSTRIAL APPLICATIONS SESSION

- Tuning with Body Sensor for Optimal Ultrasonic Drilling and Coring - Tao Song
- New Technologies for the Design of Advanced Ultrasonic Transducers for High-Power Applications - Lorenzo Tsujino
- The Scanning Lazer Vibrometer: Using In-Air Measurements for Predicting Underwater Performance - Walter Boober
- A Constant Beamwidth Transducer for Ultrasonic Applications - Kim C. Benjamin
- A Versatile High Power Ultrasonic Generator - Bruce Mortimer
- Optimal Design of Ultrasonic Transducer by Using Ansys - Shu Du

MEDICAL & STANDARDS SESSION

- Multi-Frequency Harmonic Array Transducer for Medical Imaging - Bahram Jadidian
- Emerging Standards for High Power Ultrasonic Transducers - Karl Graff
- Effects of Frequency on the Cutting Ability of an Ultrasonic Surgical Instrument - Jeff Vaitekunas
- Lysing Bacterial Spores by Sonification Through a Flexible Interface in a Microfluidic System - Michael Taylor
- The High-Power Ultrasound Compaction of Pharmaceuticals - Diolati Ermino

Register Today!! Make your reservation before September 1st and Receive a discount. UIA members get a discount if you are registered for both the IEEE-UFFC meeting and the UIA Symposium.

UIA Sustaining Members

APC International, Ltd.
Branson Ultrasonics Corp.
Bullen Ultrasonics, Inc.
CAE Blackstone
Crest Ultrasonics
Dentsply International
Preventive Care
Dukane Corporation
Eastman Kodak Company
EDO Corporation, Acoustics Div.
Ethicon Endo-Surgery Inc.
Greer Manufacturing. Inc.
Herrmann Ultrasonics, Inc.
Hyde Park Electronics
Lewis Corporation
Misonix, Inc.
Morgan Matroc, Inc.
Piezo Kinetics, Inc.
Piezotech, LLC
The Procter & Gamble Co.
Sonics & Materials, Inc.
Sonic Systems
Sonicor Instrument Corp.
Sonobond Ultrasonics
Sono-Tek Corporation
Spembly Medical Limited
Stapla Ultrasonics Corporation
Staveley Sensors, Inc.
Tecnea Engineering S.R.L.
Telsonic Ultrasonics
Valleylab, Inc.
Zevex, Inc.

Sponsorship & Advertising Program

Dear Colleague:
On behalf of the 2001 UIA Conference Committee, I invite you to participate in our *Sponsorship & Advertising* program. Your support, which will be greatly appreciated, will help defray the costs of meeting elements such as breaks, reception, banquet, and grants for student/foreign attendance.

SYMPOSIUM GOALS

- To present a world-class educational program on timely issues pertaining to the field of high power industrial and medical ultrasonics.
- To provide a forum for discussion and networking among professionals employed or interested in the science and application of ultrasonics.
- To provide presentations that will compliment and have synergy with the IEEE International Ultrasonics Symposium and the World Congress on Ultrasonics being held immediately prior to the UIA 31st Annual Symposium.
- To provide a program that will be of mutual benefit to the individuals attending. These people will be interested in the cross fertilization of ideas that is available from divergent applications and research using ultrasonic energy.

INTENDED AUDIENCE (targeted attendance 200+)

- Engineering, marketing, management from industrial and medical organizations.
- Consultants, service providers with ultrasonic expertise.
- Teachers, students, researchers from academic institutions.
- Regulatory people, standards developers, measurement laboratories, government groups.

WHY SHOULD YOU PARTICIPATE?

- To provide needed resources for the Ultrasonic Industry Association so that it can grow and provide enhanced member services to you.
- To keep your company name in the minds of the attendees.
- To encourage the participation of students and users in the activities of the UIA.
- To be recognized as an industry leader.
- To pay for or reduce the symposium expenses.

WHAT WILL YOU RECEIVE AS A SPONSOR?

- Recognition in the On-Site Symposium Program, which will have the meeting schedule, abstracts of the presentations, and the list of attendees who have pre-registered.
- A complimentary ad in the program, depending on your level of giving.
- A placard with your company name displayed at the event sponsored. (Your specific request for a desired event will be honored if at all possible.)
- Verbal acknowledgement of your participation during the annual meeting.
- Platinum Sponsors will receive one complimentary registration for the Symposium.

Sponsor forms available online at www.ultrasonics.org/Sponsor.PDF or call UIA Headquarters for a copy of the form 217/356-3182

Sponsorship & Advertising Program

SPONSORSHIP CATAGORIES

- **Platinum Sponsors:** ***$1000 and up in contributions and dollars spent on advertising in the conference program***
  - § One complementary registration
  - § Complementary ½-page ad in the program
  - § Recognition as previously indicated
- **Gold Sponsors:** ***$500 to $999 in contributions and dollars spent on advertising in the conference program***
  - § Complementary ¼-page ad in the program
  - § Recognition as previously indicated
- **Silver Sponsors:** ***$250 to $499 in contributions and dollars spent on advertising in the conference program***
  - § Complementary 1/8-page ad in the program
  - § Recognition as previously indicated
- **Bronze Sponsors:** ***$100 to $249 in contributions and dollars spent on advertising in the conference program***
  - § Recognition as previously indicated

SPONSORSHIP GOALS

Application of monies can be specifically requested by the sponsor or can be given as a non-allocated donation. Multiple companies may share sponsorships for an event.

Opening Mixer/Welcome Reception	$2,000
Awards and Annual Meeting Luncheon	$1,500
Closing Luncheon	$1,000
Pre-Dinner Reception	$1,500
Banquet	$2,000
4 Breaks @ $500	$2,000
2 Continental Breakfasts @ $1000	$2,000
5 Students @ $100	$ 500

ADVERTISING RATES

All ads are black and white and are in the body of the program. Sponsors may increase the size of their complimentary ad by purchasing additional ad space.

Size	Meeting Attendee	Non-Meeting Advertiser
Full Page	$300	$500
Half Page	$150	$250
Quarter Page	$100	$200
Eighth Page	$50	$100

DEADLINES

Payment	**Due October 1, 2001** (Payment reminders will be sent upon request.) Make checks payable to the Ultrasonic Industry Association. Credit card payments are accepted. Please provide your IRS identification number.
Ad Copy	Camera-ready artwork due August 15, 2001.

CONTACT INFORMATION

Please send payments, ads, and inquiries to Seth Hettinger, UIA Managing Director,
1111 N. Dunlap Ave., Savoy, IL 61874; Tel: 217-356-3182; Fax: 217-398-4119
uia@ultrasonics.org sethh@assochq.org www.ultrasonics.org

Invitation to Exhibit at the UIA Symposium

Dear Colleague:

On Behalf of the Ultrasonic Industry Association's 31st Annual Symposium, we invite you to exhibit your products and services at this conference. The 2001 Meeting is in Atlanta, Georgia at the Omni Hotel at CNN Center, October 10th - 12th immediately following the combined IEEE International Ultrasonics Symposium and World Congress of Ultrasonics meeting. This year's meeting promises to give broad exposure to the user, manufacturer, and scientific community interested in the field of Ultrasonics.

The tentative exhibit schedule is:

Wednesday 10/10/2001	1:00pm - 5:00pm	Set-up
Wednesday 10/10/2001	6:30pm - 8:00pm	Exhibits Open during Welcome Reception
Thursday 10/11/2001	7:30am - 5:00pm	Exhibits Open
Friday 10/12/2001	7:30am - 5:00pm	Exhibits Open

Display of your products or services at this conference will allow you to contact many of your potential customers. Booth spaces will be 8x10 and will come with a 6' table, 2 chairs, company identification sign, and a wastebasket. Our tradition of placing exhibitors in heavy traffic areas will increase your interaction with the conference attendees and maximize the return of your efforts.

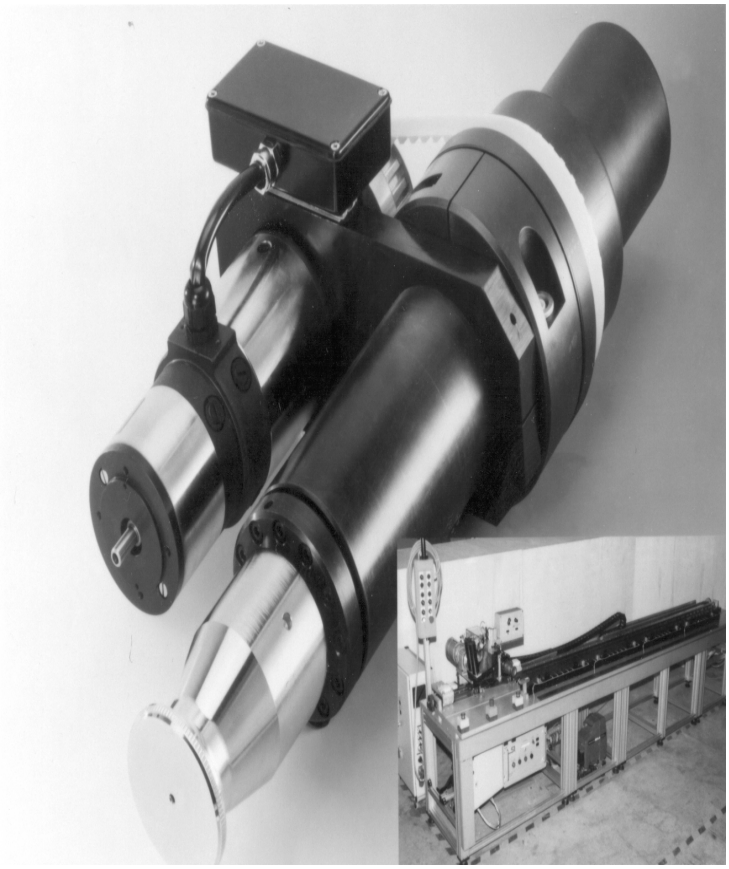
Your company would benefit by exhibiting at the UIA Meeting. The exhibit fee is $400.00, which entitles you to one meeting registration at a cost of $325.00, i.e, the exhibit only costs $75.00. The exhibit area will be central to the meeting room and at the meeting break location; thus, you can entertain customer's questions throughout the entire meeting. The exposure at this meeting should be especially good as we are working in conjunction with the IEEE Meeting.

As in previous years, we are also soliciting sponsors for our social programs such as breaks, reception, and banquet or for grants for student/foreign attendance. We would greatly appreciate your support of this key ultrasonic meeting. The names of the sponsors will be prominently displayed in our advanced booklets, symposium program, and at the appropriate events.

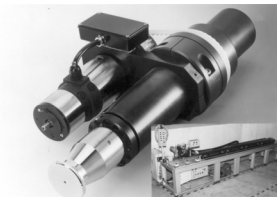
Can we count on you as an exhibitor this year? Please contact UIA at 1111 N. Dunlap Ave., Savoy, IL 61874, Phone: 217/356-3182, Fax: 217/398-4119 or contact Ron Staut at 570/726-6961 to register or if you have any questions. Reserve your booth early to ensure a space. Hope to see you at the conference!

2001 UIA Conference Committee

Exhibitor forms available online at www.ultrasonics.org/Exhibit_Form.PDF or call UIA Headquarters for a form at 217/356-3182



Advanced Control Systems for Ultrasonic Seam Welding



Wilmington, MA...Stapla Ultrasonics announces its RST and RSK systems for seam welding metal sheets and welding sheet metal and foils to tubing in the manufacture of heat exchangers, solar collectors, and other applications. One specific high-volume production example is welding copper fins to copper tubes.

In the RST system, the welder moves down a track to seam weld stationary material. In the RSK system, reel-fed stock is continuously welded as it passes under the ultrasonic welder.

The RST system is designed for ultrasonically welding pre-set lengths. The system is modular and can be extended to make continuous welds up to 12 meters in length. The welding unit moves down a linear track with weld speeds of up to 24 feet/min. (8 meters/min.). Pneumatic clamping brackets are provided to handle tubes of 0.23- to 0.6-inch (6- to 15-mm) diameters as well as foil and sheet metal in widths up to 7.8 inches (200mm).

The RSK system by Stapla is designed to remain stationary while both the tube and foil material are fed in a precisely synchronized process. The RSK can weld tubes of 0.23- to 0.6-inch (6- to 15-mm) diameter as well as foil and sheet metal in widths up to 7.8 inches (200 mm).

Both the RST and RSK systems are equipped with Stapla's ST 3000 controller to continuously monitor key welding parameters, including compression, to maintain consistent weld quality over the length of the seam. The monitor features a large LCD screen that displays both numerical settings and 3-D schematics of key components to help operators set, store, and retrieve up to 1,000 weld settings without reprogramming or tool change.

Designed to support high production rates and sequential operations, the controller communicates all necessary preventive maintenance information to the operator and signals when there is a problem caused by materials handling equipment or any variance in the parts being welded.

Custom tooling for manual and automatic manufacturing is available to provide customers with integrated seam welding solutions to reduce costs and improve manufacturing yields.

For complete information contact: Stapla Ultrasonics Corporation at 375 Ballardvale Street, Willmington, MA 01876, Telephone: 978/658-9400, Fax: 978/658-6550, email: info@staplaultrasonics.com.

EWI Workshop on Ultrasonics Applied to Metallurgy and Manufacturing Draws Strong Interest

On June 12-13, EWI, in cooperation with leading research institutes in Russia and Ukraine, and other partners presented a workshop on innovations in "High Power Ultrasonics Applied to Metallurgy and Manufacturing" at EWI in Columbus. Based on the fact that intense levels of ultrasonic energy, when applied to materials and processes, can have a wide range of dramatic effects, including changing materials, accelerating processes, and improving manufacturing operations, the workshop drew attendees from several areas of manufacturing and from the ultrasonics industry.

Although it was known that researchers in Russia and Ukraine have been world leaders in the application of high power ultrasonics to a wide range of industrial operations ranging from casting to metal forming, the transfer of these technologies to industries in North America has not been rapid. It was the purpose of the workshop to accelerate this process, focusing on selected technologies in metallurgy and manufacturing.

The workshop featured several of the scientists who have led many innovations in metallurgy and manufacturing, doing both the basic research that developed the technologies and overseeing practical application in manufacturing environments. Speakers included Dr. Oleg Abramov of the Institute of General and Inorganic Chemistry, Moscow; Dr. George Prokopenko of the Institute of Metal Physics, Kiev; Drs. Oleg Gradov and Vladimir Abramov of the Centre of Applied Acoustics, Moscow; and Dr. Yuri Kudryavtsev of ITL, Toronto. These international speakers were joined by Dr. Mani Mina of Etrema, Ames, Iowa and Dr. Karl Graff, Workshop organizer, of EWI.

The workshop provided a brief overview of the fundamentals of high power ultrasonic technology, with special attention being given to the very high power ultrasonic systems that have been developed in Russia and Ukraine to drive various processes. Dr. Mina provided an overview of the new, very powerful Terfenol-D-based, 6-kW transducer manufacturing by Etrema.

Five key technologies were presented. The first discussed was molten metal processing, where it was shown how high power ultrasound can profoundly influence molten metals at several stages of their production and use, including degassing of the melt, structural refinement of ingots and castings, preparation of as-cast composites, improved crystal growth and zone refinement, and atomization of the melt for powdered metal production.

A second area was that of surface treatment and cladding. Russian and Ukrainian researchers have developed innovative approaches, involving ultrasonic impact, for surface-hardening manufactured parts. Other innovations described related to use of high power ultrasound for application of cladding to wires, thin strips, and surfaces.

A third area was that of weld treatment, where use of ultrasonic impact technology is used to modify the surface and near-surface properties, including weld contour, of fusion welds. The next area covered was metal forming and deformation. Researchers in the Ukraine have focused on the effects of intense ultrasound in changing the plastic flow of materials in forming and cladding. Based on what they term the "acoustoplastic effect," the applications of this innovative technology to wiredrawing and manufacture of thin ribbons and foils was covered. This was a special session given by Dr. Prokopenko in memory of Dr. Kozlov, the originally scheduled speaker who had died shortly before the workshop. Dr. Prokopenko's discussion covered mechanical alloying with the help of ultrasonics, including alloying of metal surfaces by ultrasonic treatment and mechanical alloying of powder materials.

The fifth area covered was that of ultrasonic metal welding, an area of specialization of EWI. Dr. Graff reviewed the basic technology of the field and then noted recent developments in higher power systems and increased applications for structural purposes. The discussions concluded with an overview of other industrial applications of high power ultrasonics, including machining, heat treatment, preparing in-situ composites, and chemical process enhancement. Several periods of laboratory demonstrations were interspersed throughout the two-day workshop.

Because of its extensive capabilities in applications of high power ultrasonics in materials joining and other processes, EWI was pleased to host this successful workshop and is considering a second event next year. For more information on workshop content and presentations and on exploring various applications highlighted at the workshop, contact Karl Graff at EWI (tel. 614-688-5269 or karl_graff@ewi.org).

In the News

APC International Ltd. Acquires Ferroperm Piezoceramics A/S, Denmark

Mackeyville, Pennsylvania USA: APC International Ltd. announces the acquisition of Ferroperm A/S of Kvistgard, Denmark.

Ferroperm Piezoceramics A/S is a manufacturer with over 45 years experience producing high quality advanced piezoelectric materials for vibration sensors, underwater acoustics, high sensitivity materials for medical diagnostics, and ultra-high precision shear ceramics for accelerometers. In addition, the company has a series of new and very promising research and development projects being launched in partnership with the European Commission.

APC International Ltd. (APCI) is a global manufacturer of high quality piezo ceramics and piezo products with subsidiaries and joint partnerships in the USA, Czech Republic, China and Russia. American Piezo Ceramics Inc., located in Mackeyville, Pennsylvania, manufactures high quality piezo ceramics for medical and industrial applications. Piezokeramika s.r.o.-EPC, located in Librice, Czech Republic, was acquired in 1991 from the state-owned company Tesla, Czech Republic. Piezokeramika manufactures high volume power ceramics for ultrasonic cleaning and welding transducers as well as produces powders for use in manufacture of all piezoelectric ceramic applications. APC Product Inc., located in Pleasant Gap, Pennsylvania, focuses on developing relationships with high volume manufacturers throughout Russia, China, and other Pacific Rim Countries with an emphasis placed on single crystals for optical and metapplications and gives customers a single source supplier from the initial design stages through high volume production.

Stapla Ultrasonics Appoints Donald R. Patten Applications Manager—Plastics

Wilmington, MA: Donald R. Patten has joined Stapla Ultrasonics Corporation, a leading manufacturer of ultrasonic welding systems, as Application Manager—Plastics. According to Stapla President Saeed Mogadam, "Patten comes to Stapla with over 12-years experience in ultrasonic plastic welding, tool design, and application development plus hands-on experience managing ultrasonic medical and automotive manufacturing operations. This experience is invaluable in supporting the aggressive roll-out of our new K1 Ultrasonic Plastic Welding System. With this system, Stapla is bringing advanced ultrasonic technology and technical support, originally developed for high-precision metal welding applications, to the plastics industry."

Prior to joining Stapla, Patten was manager of the Application Laboratory at Herrmann Ultrasonics and Tooling/ Application Engineer at Dukane Ultrasonics. He also served as Production Supervisor at Filtertek, Inc., where he was responsible for supervision of the ultrasonic welding department.

"With his proven record in application development and customer support, Patten has the engineering and business background needed to support the introduction of advanced ultrasonic welding technology to the plastics industry. This technology enabled Stapla to become the leader in ultrasonic metal welding with more installations than any other manufacturer," Mogadam stated.

Patten did his undergraduate studies at the University of Wisconsin and has participated in a number of TQM (Total Quality Management) programs as well as Ford Motor Company quality initiatives.

Stapla Ultrasonics is a key supplier of ultrasonic welding equipment to the medical, automotive, packaging, plastics, computer, electronics, and telecommunications industries.

For more information, contact Stapla Ultrasonics Corporation at 375 Ballardvale Street, Wilmington, MA 01887, Telephone: 978/658-9400, Fax: 978/658-6550, email: info@staplaultrasonics.com.

Memorial

H. Philip Hovnanian

H. Philip Hovnanian passed away on May 14th at his home in Riverdale, Bronx, NY after suffering a resurgence of prostate cancer. Phil was an old timer in the ultrasonics business. In the early 1960s while with Avco Research, he performed some of the first investigations of in-vitro ultrasonic debridement of cardiac valves using a chisel vibrating at 26 kHz. He subsequently worked for many years for Cavitron as a vice-president for technology during the development of the Cavitron/Kelman phaco-emulsifier and the Cavitron Ultrasonic Surgical Aspirator (CUSA). He was known for a comprehensive familiarity with the technology and for his genial and warm regard of everyone in the industry. Liked by everyone he met, his cheer and encouragement to young pioneers will be greatly missed.

Send future newsletter information to:

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web: www.ultrasonics.org

President's Message... Mark Schaffer

Summer is usually the slow, relaxing time of year. But for the UIA, things have never been busier. We just had a very successful "specialized" meeting on applications of high power ultrasound in medicine. Held in Atlantic City in May, it brought together a diverse audience, who participated in an all-day, focused workshop on medical applications. Topics ranged from the near-term, such as prostate treatments that have now been FDA approved, to longer-term projects, such as spherical ultrasound arrays for the treatment of cranial tumors. The luncheon speaker, Dr. Barry Goldberg, is a world-renown expert in ultrasound; the UIA also gratefully acknowledges his cooperation in coordinating our meeting with his "Leading Edge" conference. The meeting was well attended and well received. We look forward to having meetings like this on a regular basis, and we are soliciting suggestions for other topics from the membership.

The highlight of the year for UIA members is, of course, the Annual Meeting and Symposium, to be this fall in Atlanta. The Symposium is being coordinated with the IEEE-UFFC Ultrasonics Symposium to allow members of both organizations a chance to "see the other side" of ultrasound. This joint meeting will allow the UIA to reach out to new members and allow our members access to new "connections." This meeting will be a unique opportunity for a total immersion in ultrasonics, and members have been mailed a postcard with a discount offer for the first 100 members that register for both meetings.

This year is a turning point for the UIA in terms of expanding our scope, reaching out to new audiences, meeting together in new venues, and aggressively working toward our Vision statement: *to be the forum for manufacturers, users, and researchers in ultrasonic technology.* Our organization is working hard to fulfill this challenge.

Ultrasonic Industry Association

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UIA Board of Directors

If you are interested in participating on the Board of Directors or a UIA Committee, please contact Fred McGowen at f.mcgowen@herrmannultrasonics.com

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