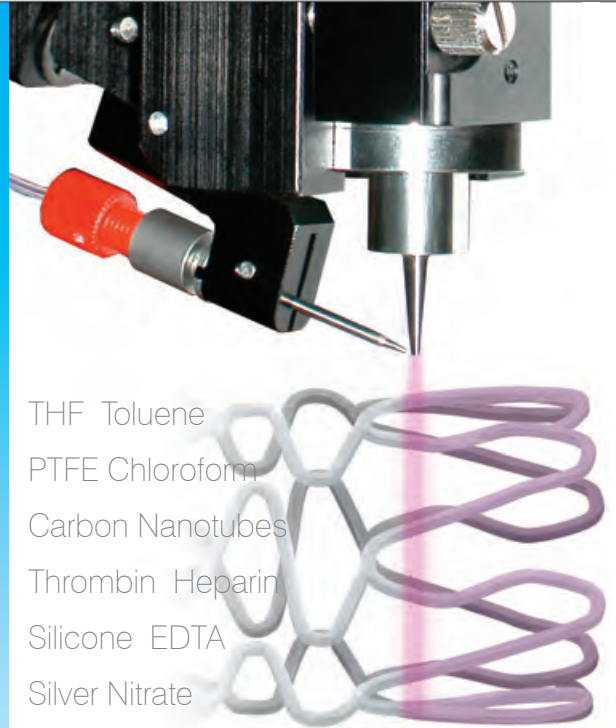


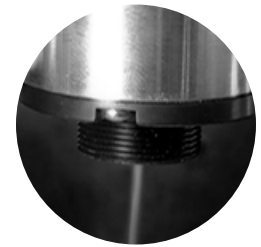
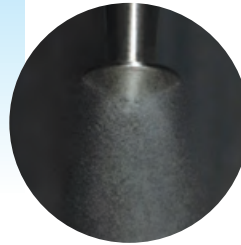
# When Precision Counts...

## Ultrasonic Nozzles for **Medical Device Coatings**

*Uniform ultra-thin film coatings onto stents, catheters, balloons, endoscopic instruments, pacemakers, heart valves, glucose monitors, sensors, medical textiles, blood collection tubes, surgical implants, orthopedic implants, and diagnostic devices.*



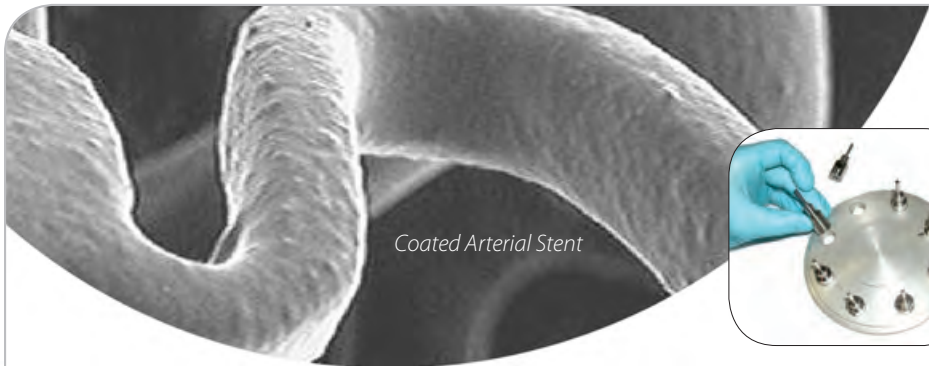
THF Toluene  
PTFE Chloroform  
Carbon Nanotubes  
Thrombin Heparin  
Silicone EDTA  
Silver Nitrate



### Why Ultrasonic Nozzle Technology?

- Low velocity, soft spray with minimal overspray saves up to 80% in coating material
- Independent control of process parameters including flow rate, spray velocity, drop size and deposition
- Precise control over a wide range of flow rates
- Non-clogging, repeatable performance
- Tight drop distribution creates highly uniform thin films
- Choice of drop size depending on nozzle frequency (drop sizes range from 18 - 49 microns)
- Deagglomeration of particles in suspension due to ultrasonic vibration
- Excellent penetration and adherence to complex geometries without webbing

**SONO•TEK Corporation**  
Leadership through innovation since 1975



### MediCoat II

Automated stent coating system for high volume production.

- Two user-friendly stent loading cassettes hold up to eight stents each.
- Attach stents using Sono-Tek's exclusively designed mandrels or customer may use their own attachment.
- Integrated control of nozzle, liquid delivery, & stent motion.
- Easy load/unload chamber and sealed process chamber.



### Medical Device Coating Systems

Ultrasonic nozzle systems for applying lubricious, antimicrobial and hydrophilic thin film coatings onto:

- Cardiac, Peripheral, Biliac Stents
- Guide Wires, Catheters and Balloons
- Bandages, Wound Dressings, Sutures
- Surgical Masks, Gloves
- Hospital Textiles
- Blood Collection Tubes
- Surgical Implants - Orthopedic Rods, Pins, Screws
- Electronics, Diagnostic Devices



### Blood Collection Tubes

Targeted coating of side walls, layering of chemistries, polymers, or clotting agents.

- Custom multiple nozzle systems have been configured for high volume production needs.
- Common materials sprayed include Heparin, Silicone and EDTA. Nozzle design allows atomizing surface to reach inner diameter lengths.
- Fully automated control of electronics.
- Soft, low velocity spray will not collect on base of tubes.
- 20+ years of BCT process experience.



### Implantable Stent Coatings

Designed to coat cardiac or peripheral stents with anti-restinosis polymers. Provides uniform thin film coverage of all complex strut geometries without webbing of the polymer material.

#### MediCoat DES1000

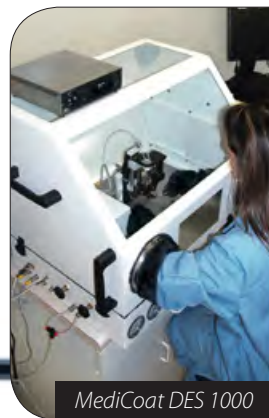
A lab-friendly benchtop system incorporates a programmable stent movement and rotation device, located in an easily accessible spray area that allows for manual loading and unloading of stents in a controlled inert environment.

- Integrated control of the nozzle, liquid delivery, and stent movement/rotational device.
- Wide range of delivery rates from 0.3-100 ml/hour.
- All system components are compatible with the typical solvents and polymers used in stent coating.



### ExactaCoat System

Integrates any ultrasonic nozzle for a full coating solution, including low oxygen environments, dual nozzle configurations, fully automated XYZ motion control and Windows®-based programming and recipe storage.





## Medical Textiles

WideTrack ultrasonic system for spraying silver, Silane, Triclosan and ammonium-based antimicrobial agents onto a wide variety of textiles to prevent infection and/or inhibit the growth of mold, gram (+) and gram (-) bacteria and fungi.

- Flexible spray width control for any size, including wide webs.
- Can be configured for single or dual side application, spray up or spray down.
- Precise coating allows for uniform release of antimicrobial compound onto applied surfaces, ensuring functional properties.
- Thin film coatings minimize material usage by up to 80%.

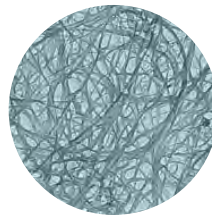
### Materials sprayed include:

- Antimicrobials
- Adhesives
- Polymers
- Silver Nitrate
- Silicone
- Heparin
- Blood Plasma
- EDTA
- CNTs
- Hydrophilic/ Hydrophobic Films
- Chloroform
- Acetone
- Toluene
- DMAC
- Omega 3
- Lipids/proteins
- Enzymes
- THF
- PTFE
- Bioactive Peptides

## Nanotechnology (CNTs)

Ultrasonic nozzles are proven successful for spraying carbon nanotube solutions for diagnostic devices and new materials R&D processes.

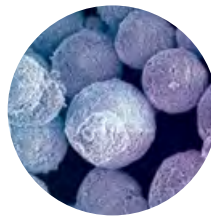
- Ultrasonic vibrations of the nozzle break apart naturally agglomerated particles, creating more uniform coatings.
- Capable of extremely small batch production (1 ml/hr flow rate).



## Orthopedic Implants

Thin film coatings of antimicrobial agents or bone growth enhancing solutions onto rods, screws, plates, or joint replacements.

- Low velocity spray readily adheres to all surfaces.
- Ability to adjust coating morphology characteristics.
- Tight drop distribution uniformly coats any shape.



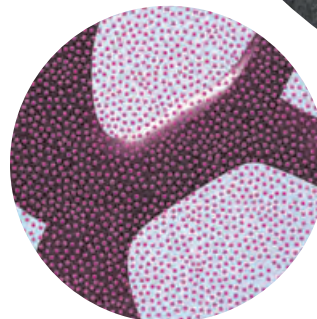
## Microencapsulation

Applications include targeted drug delivery, slow release pharmaceuticals, and nanoencapsulation.



Radial Spray Nozzle for BCT Coating

The ultrasonic advantage



ULTRASONIC ATOMIZATION



AIR PRESSURE



## Advanced Spray Coating Technology for Superior Functional Medical Coatings



### *Customer comments:*

"We were developing a blood-contacting device for use in the OR and ICU and our previous coating technologies included dip-coating, thin film draw-down or knife-coating techniques, and pressure nozzle spraying, none of which had the efficiency or yields we are currently experiencing with a fine-tuned ultrasonic sprayer. We are in the point-of-care blood diagnostics business."



"The precise control of process variables that ultrasonic spraying technology provides enabled us to fine tune our process development, increase yields from 30% to 95%, and ultimately bring an intravenous Class II medical device from product to market in under 2 years. We could not have done this with any other technology."

**SONO•TEK Corporation**

medevice10r1

## *Global Solutions in Ultrasonic Spray Technology*

*Sono-Tek's corporate headquarters are located in Milton, NY USA, with additional offices in Hong Kong. Our extensive global support and distribution network provides factory trained personnel with local language support in dozens of countries worldwide.*



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**Comprehensive Solutions in Process Automation and Technology**