

## ABOUT SONIC CONCEPTS, INC.

Sonic Concepts has been active in the development of the HIFU field for over seventeen years. The company's extensive HIFU experience combined with an in-depth knowledge of ultrasound materials has resulted in optimized HIFU transducer designs. Sonic Concepts' HIFU transducers offer an efficient transfer of electrical to acoustic energy over a wide frequency band.

Over the past two decades Sonic Concepts has increased the electrical to acoustic efficiency to over 90% at the HIFU transducer's fundamental mode. This minimizes the amount of heat generated within the transducer. To remove the remaining heat from the HIFU transducer, Sonic Concepts provides cooling system components and offers integrated transducer temperature sensors. Numerous HIFU transducer models can be equipped with coupling cones and water ports to provide an acoustic coupling path.

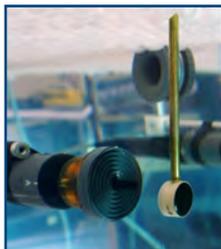
Sonic Concepts' HIFU transducers provide a broad power bandwidth, enabling user-adjustable operating frequencies. Most Sonic Concepts HIFU transducers can optionally be used at their third harmonic resonance. Although third harmonic operation is lower in efficiency, this option supports a wider range of HIFU applications within one transducer. The efficiency, quality, timely delivery, and pricing of Sonic Concepts HIFU transducers are the reason Sonic Concepts continues to grow within the HIFU community.

Working with Sonic Concepts on your HIFU project will result in reliable, high quality transducers developed at a reasonable cost.

The Pacific Northwest is home to a variety of ultrasound companies and institutions that are in the frontier of new ultrasonic devices and systems. Sonic Concepts, Inc. has strategically located its manufacturing and consulting services in Bothell, Washington near the center of this activity.

## TESTING

Sonic Concepts manufactures instrumentation to test the transmit efficiency, RF input power, and acoustic power output of therapeutic transducers. Sonic Concepts also offers beam plotting services for transducers requiring pressure maps of the radiating surface or the focal volume.



*Acoustic calibration test*

## ADDITIONAL SERVICES

Sonic Concepts supports its customers with new product development and manufacturing services in small and large volumes. We provide services in several areas:

- Ultrasound product design and prototype development
- Custom HIFU array design and prototyping
- Calibrated measurements of transmitted acoustic pressure, receive sensitivity, and total acoustic power
- Beam plot measurements and simulations of transducer directivity
- Hydrophone Calibration
- Environmental testing of ultrasonic transducers to 3500 PSI and 100° C
- Technical audits



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# SONIC CONCEPTS

## ULTRASOUND ENGINEERING AND MANUFACTURING

### SPECIALIZING IN:

- Standard and Custom HIFU Transducers
- Custom Array Transducers
- Ultrasound Instrumentation
- Hydrophones and Calibration
- Product Design and Prototype Development
- Developer of PiezoCAD®

**WWW.SONICCONCEPTS.COM**

## DEEP HIFU TRANSDUCERS

Numerous transducers (1 to 10 MHz) are developed by Sonic Concepts for high-intensity focused ultrasound (HIFU) research and medical applications. Typical applications of Sonic Concepts' HIFU transducers include thermal tissue ablation, cavitation, remote palpation, histotripsy, drug activation, and various other types of biomedical treatments.



Deep HIFU transducers are for rigorous testing environments and non-hand held applications. Deep HIFU transducers accommodate applications requiring larger amounts of focal gain at the focus.

### SPHERICAL WITH FULL APERTURE:

- |                                     |                                      |
|-------------------------------------|--------------------------------------|
| <b>H-101</b> 1.1 MHz, Ø64 mm, f/1.0 | <b>H-108</b> 2.5 MHz, Ø60 mm, f/0.8  |
| <b>H-104</b> 0.5 MHz, Ø64 mm, f/1.0 | <b>H-115</b> 0.25 MHz, Ø64 mm, f/1.0 |
| <b>H-106</b> 2.0 MHz, Ø64 mm, f/1.0 | <b>H-151</b> 1.1 MHz, Ø64 mm, f/1.6  |

### SPHERICAL WITH 20 mm CENTRAL OPENING:

- |                                     |                                     |
|-------------------------------------|-------------------------------------|
| <b>H-102</b> 1.1 MHz, Ø64 mm, f/1.0 | <b>H-117</b> 0.25 MHz Ø64 mm, f/1.0 |
| <b>H-107</b> 0.5 MHz, Ø64 mm, f/1.0 | <b>H-161</b> 1.1 MHz Ø125 mm, f/1.0 |
| <b>H-148</b> 2.0 MHz, Ø64 mm, f/1.0 | <b>H-149</b> 0.2 MHz Ø110 mm, f/0.6 |
| <b>H-147</b> 2.5 MHz, Ø60 mm, f/0.8 |                                     |

### SPHERICAL DUAL FREQUENCY:

- H-179**, 0.25, 0.5, 1.1 or 2.0 MHz, Ø64 mm, f/1.0



### CYLINDRICAL DEEP HIFU TRANSDUCERS:

- H-154**, 0.5 MHz 50 x 50 mm, f/1.0  
**H-163**, 0.5 MHz 112 x 95 mm, f/0.5  
**H-168**, 0.85 MHz 50 x 50 mm, f/1.0

### CUSTOM CONFIGURATION:

Sonic Concepts has manufactured over 100 different HIFU transducer configurations. Please contact us with your requirements.

All Transducers are available as MRI Compatible upon request.

## SURGICAL HIFU TRANSDUCERS

Surgical HIFU transducers are for hand held applications for use with a 50 ohm RF amplifier with a maximum pulsed power level of 300 watts. A matching network is provided integral to the handle and can include an optional thermocouple and water coupling system.

- **SU-101** 2.0 MHz Ø33 mm, f/1.7
- **SU-102** 3.5 MHz Ø33 mm, f/1.7
- **SU-107** 3.5 MHz Ø33 mm, f/1.1
- **SU-108** 5.0 MHz Ø33 mm, f/1.1



## ARRAY HIFU TRANSDUCERS

### 93 ELEMENT ARRAYS

#### 1.0 - 5.0 MHz

Geometrically Packed, Ø110 mm, f/0.6  
Optional opening, Ø20 - 42 mm

### 256 ELEMENT ARRAYS

#### 1.0 - 5.0 MHz

Geometrically Packed, Ø200 mm, f/1.0  
Optional opening, Ø20 - 60 mm



### 512 ELEMENT ARRAYS

#### 1.0 - 5.0 MHz

Random Packed, Ø200 mm, f/0.75  
Optional opening, Ø20 - 75 mm

*Array Options: Central opening for imaging or PCD's, coupling system, and matching network*

## HYDROPHONES

An assortment of hydrophones (0 to 20 MHz) are offered for pulse echo, receiving, and passive cavitation detection (PCD). Hydrophones are calibrated in an anechoic water test tank using the planar scanning integral technique. Reciprocity calibration is available upon request.

### Standard hydrophone configurations:

- **Y-102** (PCD, cylindrical focus)
- **Y-104** (High Intensity)
- **Y-105** (Omnidirectional)
- **Y-107** (PCD, spherical focus)
- **P-108** (Pulse Echo)
- **Y-120** (High Intensity)



## TRANSDUCER INSTRUMENTATION & ACCESSORIES

Additional Services and accessories manufactured by Sonic Concepts include:

- Coupling Cones
- Bladder Coupling Systems
- Portable Test Tank Systems
- Pre-clinical Test Apparatus

### RADIATION FORCE BALANCE

#### Models RFB100 & RFB101

- High precision scale
- Custom designed absorber material
- Custom designed balance fixture
- Measures up to 400 Watts of acoustic power
- Custom developed software, SonicScale

### WATTMETER

#### Models 21A, 22A & 23A

- High power, 20 and 200 Watt scales, CW 100% duty cycle on either scale
- The 22A model provides 200 and 2000 Watt scales
- Low loss, less than 1% at 2000 Watts
- Provided with calibration; additional points are available upon request

### WATER DEGASSING SYSTEM

#### Models 104, 104+, 105, 105+, 107

- Desktop cabinet with clear door, plastic water housing, Tygon tubing (Wall-mount kit included)
- 60cm H x 40cm W x 25cm D (24"H x 16"W x 10"D)
- <18%\* saturation in 60 minutes (104, 105, 107)
- <7%\* saturation in 60 minutes (104+, 105+)
- Fill and drain valve, timed shut off

\* Percentages based on 100% initial saturation, at room temperature, for volumes up to 10 liters

Sonic Concepts specializes in custom designed transducers based on the design requirements of customers.  
Contact: [sales@sonicconcepts.com](mailto:sales@sonicconcepts.com)