

## ABOUT SONIC CONCEPTS, INC.

Sonic Concepts has been active in the development of the HIFU field for over sixteen years. The company's extensive HIFU experience combined with its 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.

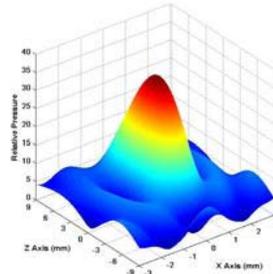
Over the past two decades Sonic Concepts has increased the electrical to acoustic efficiency to over 90% at the HIFU transducer's fundamental mode. This minimizes the amount of heat generated within the transducer. To remove the remaining heat from the HIFU transducer, Sonic Concepts provides cooling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

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 3rd 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 high quality, high reliability HIFU transducers, developed on schedule and 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.

*"Focused on optimizing  
ultrasound transducer and system  
performance, reliability and quality."*



*Simulation showing the lateral XY pressure plot  
of an H-101 transducer's geometric focus*



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ULTRASOUND ENGINEERING AND MANUFACTURING



*Specializing in Ultrasonic  
Transducers and Systems*



- Standard and Custom HIFU Transducers
- Custom Array Transducers
- Ultrasound Instrumentation
- Hydrophones and Calibration
- PiezoCAD® Modeling Software
- Consulting Services, Product Design & Prototype Development

## DEEP HIFU TRANSDUCERS

Numerous transducers (1 to 10 MHz) have been 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.

Sonic Concepts' H-series deep HIFU transducers are for non-hand held applications. These deep HIFU transducers feature high focal gain and power ratings to several kiloWatts.

### Standard H-series models:

- H-101 1.1 MHz
- H-102 1.1 MHz
- H-104 500 kHz
- H-106 2.0 MHz
- H-107 500 kHz
- H-108 2.5 MHz
- H-115 250 kHz
- H-117 250 kHz
- H-140 120 kHz
- H-149 200 kHz

## SURGICAL HIFU TRANSDUCERS

Surgical HIFU transducers are designed for hand held applications. Most Surgical HIFU transducers are intended for use with a 50 ohm RF amplifier with a maximum pulsed power level of 300 Watts. The matching network is integral to the handle. An optional thermocouple and water cooling system is available upon request.



### Standard SU-series models:

- SU-101 2.0 MHz
- SU-102 3.5 MHz
- SU 103 3.5 MHz
- SU-106 10.0 MHz
- SU-107 3.5 MHz
- SU-108 5.0 MHz

## MRI COMPATIBLE TRANSDUCERS

We offer MRI compatible versions of most of our HIFU transducers and hydrophones.

## HYDROPHONES

An assortment of hydrophones (0 to 20 MHz) are offered by Sonic Concepts for pulse echo, receiving, and passive cavitation detection (PCD). Sonic Concepts calibrates its hydrophones 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)

## 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*

### RADIATION FORCE BALANCE 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 21A & 22A

- 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

Sonic Concepts specializes in custom designed transducers\* based on the design needs of customers. For more detailed information on the transducer of interest, contact:

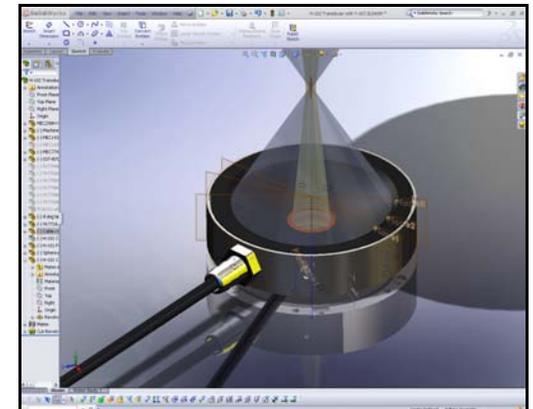
[sales@sonicconcepts.com](mailto:sales@sonicconcepts.com)

\* All transducers are available as MRI compatible upon request.

## SERVICES

Sonic Concepts supports its customers with new product development and manufacturing services in small and large volumes, providing 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



*Y-107 PCD hydrophone measuring sub-harmonics of an H-101 transducer*