ONDA

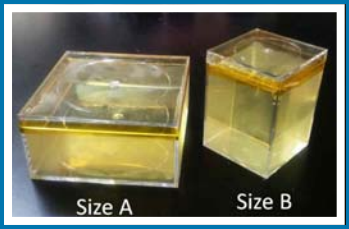
Putting Confidence in Ultrasound

HIFU Phantom Gel

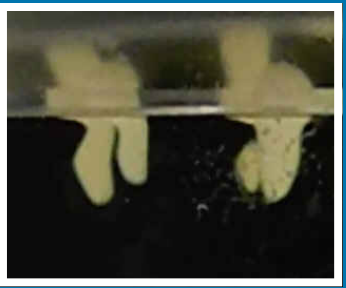
The complexity of testing HIFU devices in animal tissue is significantly reduced by using our proprietary recording gels. Phantom gels are crystal clear synthetic gels that produce lesions of the same position, size and shape as those produced in real tissue when ultrasonic power is applied to the gel. The lesions appear as white three-dimensional solid profiles inside the clear gel and are stable for many weeks. The gels are shipped in clear plastic boxes with lids. The product is stable for several weeks at room temperature, and longer if refrigerated.

Here are some applications for our HIFU phantoms:

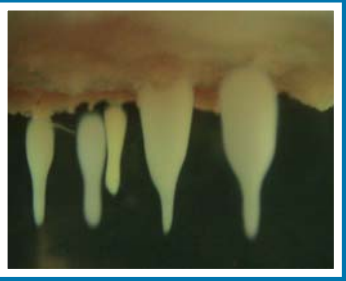
- **R&D:** Many ultrasonic transducer parameters such as transducer geometry, frequency, and power profiles can be evaluated in a short amount of time without the problems caused by tissue variability. The progression of lesion growth, position, size and shape versus time can be recorded and evaluated. To see a video of the lesions being formed, please click here.
- **Manufacturing Quality Control:** Phantom gels can detect many defects in HIFU systems such as beam shape variations and alignment problems.
- **Transducer Performance Evaluation and Protocol development:** For any medical procedure it is critical to detect even subtle changes in HIFU and other ultrasonic system performance before and after the procedure. One can use phantom gels to confirm ultrasonic system, system protocol, and detector feedback loop performance.
- **Training:** The use of these clear phantom gels in training can dramatically improve system operator performance by providing immediate visual feedback. Watching the lesion grow as power is applied is not possible using living tissue.



HIFU Phantom Gel



Visualize transducer performance in 3D



Simulate human tissue conditions

HIFU Phantom Material Properties

- **Density:** 1060 kg/m^3
- **Phase velocity:** 1600 m/s
- **Attenuation Coefficient**: 0.6 dB/(cm-MHz)
- **Specific Heat:** 3850 J/(kg-°K)
- **Thermal Conductivity**: 0.55 W/(m-°K)
- **Optical:** Turns permanently opaque when temperature reaches a threshold of 70 °C (this phenomenon results in the formation of tissue-mimicking lesions when the phantom is exposed to high intensity ultrasound)

HIFU Phantom Sizes

HIFU phantoms are available in two standard sizes or for an extra fee can be made in sizes to customer specification. The two standard sizes are:

Size "A"

- **Depth:** 38 +/- 3 mm
- **Surface available for exposure to ultrasound:** 97 mm x 97 mm
- **Container:** 101 mm x 101 mm x 51 mm polystyrene box with removable lid transparent walls, 2.1 mm thick

Size "B"

- **Depth:** 65 +/- 3mm
- **Surface available for exposure to ultrasound:** 54 mm x 54 mm
- **Container:** 58 mm x 58 mm x 79 mm polystyrene box with removable lid transparent walls, 2.1 mm thick