

# Shear Wave Liver Fibrosis Phantom

## Model 039



**ZERDINE® Inside**  
A registered trademark of CIRS

### Measure Known Tissue Elasticity with Shear Wave Systems

- Certified shear wave speed measurements
- Ensure over 10 years of reliable use through reinspection and repair services

***Includes best in industry four-year warranty***

Shear wave elasticity imaging is an emerging biomarker with many possible applications, most prominently for determining the stage of liver fibrosis in a patient without the need for invasive biopsies. The design of the Shear Wave Liver Fibrosis Phantom, Model 039, was developed and validated in a joint study sponsored by the Quantitative Imaging Biomarker Alliance, and serves as the standard reference tool for determining sources of variance in shear wave elasticity measurements (see references on next page).

Our Model 039 consists of four phantoms – each filled with Zerdine® gel formulated with differing values of Young's modulus, a tissue-average speed of sound of 1540 m/s and speckle contrast levels matching that of a healthy liver.

Certification of shear wave speed will be provided with each phantom, with tests run on Verasonics Vantage™ research platform running open source code developed for the Quantitative Imaging Biomarkers Alliance (QIBA) Ultrasound Shear Wave Speed Committee. The certification sheet provides the full dispersive analysis of shear wave speed, allowing performance assessment at different frequencies.

Model 039 comes with a carry case for easy transport and phantom set up.

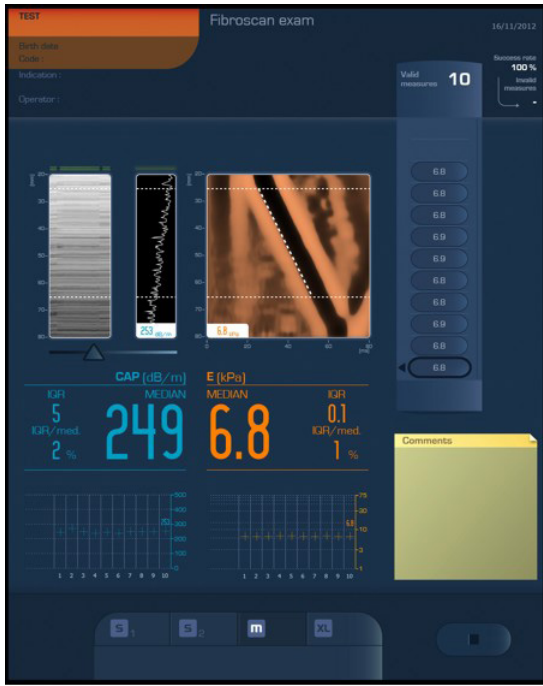
Custom versions of this phantom, with different values for Young's modulus and different sizes, are available upon special request. CIRS can also produce viscoelastic versions of this phantom.

#### Key Features for Model 039

- Set of 4 phantoms, each with a different stiffness (Young's modulus ranges from 2 – 36 kPa)
- Enables quantitative assessment of shear wave speed measurements used in the diagnosis of diffuse liver disease
- Certified measurement of shear wave speed according to protocol developed by Quantitative Imaging Biomarkers Alliance Ultrasound Shear Wave Speed committee
- Re-certification of phantoms available

# CIRS

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The Shear Wave Liver Fibrosis Phantom is compatible with many elastography systems. (Image Credit: Echosens; Paris, France)



Carry Case included with CIRS Shear Wave Liver Fibrosis Phantoms.

**SPECIFICATIONS**

|                                  |                                 |
|----------------------------------|---------------------------------|
| <b>EXTERNAL DIMENSIONS</b>       | Ø 11.6 cm, height 14 cm         |
| <b>INTERNAL DIMENSIONS</b>       | Ø 10 cm, height 12 cm           |
| <b>PHANTOM WEIGHT</b>            | 6.7 lbs (3kg)                   |
| <b>HOUSING MATERIAL</b>          | ABS Plastic                     |
| <b>MEMBRANE</b>                  | Saran Laminate                  |
| <b>SCANNING WELL</b>             | 16.5 cm x 10 cm x 1 cm deep     |
| <b>TISSUE-MIMICKING MATERIAL</b> | Zerdine® solid elastic hydrogel |

**ZERDINE® PROPERTIES**

Freezing point: 0° C  
 Melting point: Above 100° C  
 Speed of Sound: 1540 m/s  
 Density: 1.03 g/cc  
 Poisson's Ratio: 0.5

**PHANTOM STIFFNESS (NOMINAL)\***

| PHANTOM   | YOUNG'S MODULUS* | SHEAR WAVE VELOCITY |
|-----------|------------------|---------------------|
| Phantom 1 | 2 kPa            | 0.8 m/s             |
| Phantom 2 | 8 kPa            | 1.6 m/s             |
| Phantom 3 | 18 kPa           | 2.5 m/s             |
| Phantom 4 | 36 kPa           | 3.5 m/s             |

\*Certified values may vary (see Oudry et al: 2014)

**MODEL 039 INCLUDES**

| QTY | COMPONENT DESCRIPTION              |
|-----|------------------------------------|
| 4   | Shear Wave Liver Fibrosis Phantoms |
| 1   | Carry Case                         |
| 1   | Removable Scanning Well            |
| -   | 48-Month Warranty                  |
| -   | User Guide                         |
| -   | Certificate of Compliance          |

**References:**

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Milkowski A, Garra BS, Hall TJ, et al. Ultrasound shear wave speed (SWS) estimation in elastic phantoms: sources and magnitude of variability in a Quantitative Imaging Biomarker Alliance (QIBA) multicenter study. Chicago: *Radiol Soc N Am*; 2013.

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