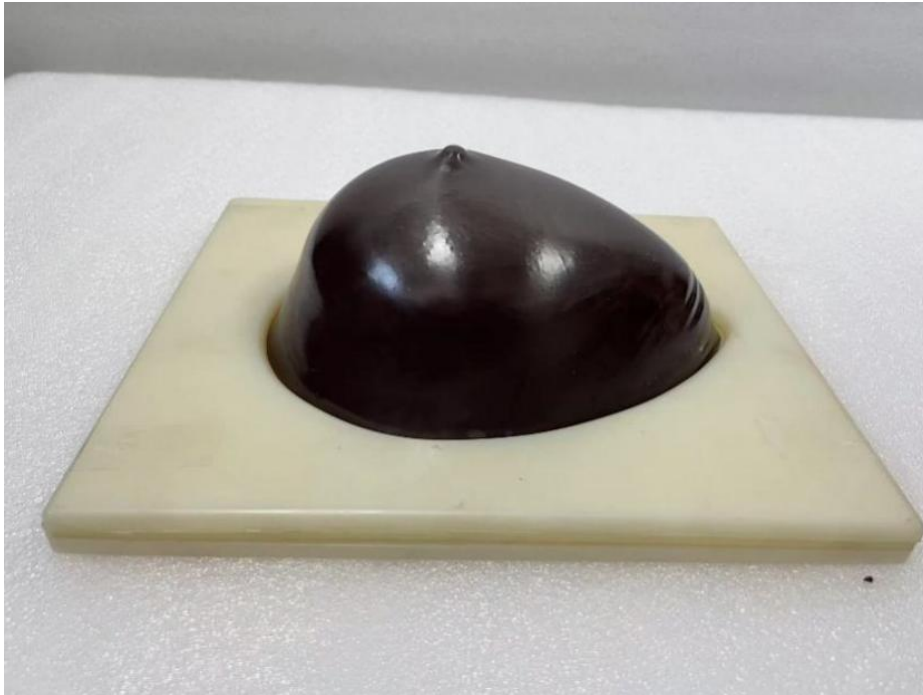


Prosthetic Breast Model (KS215TR)

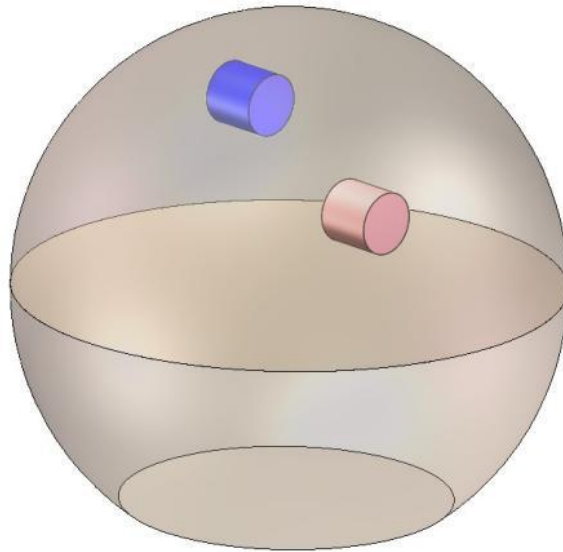
The KS215TR-1 Breast Simulation Ultrasound Elastography Phantom is designed to replicate the shape of the breast externally and embed corresponding elastic lesions internally, serving as a simulation phantom for quasi-static strain elastography imaging.



The interior of the phantom is composed of background elastic artificial tissue ultrasound (TM) materials and embedded elastic targets. It is one of the "breast series" phantom products developed and produced by the Institute of Acoustics of the Chinese Academy of Sciences, specifically used for the performance testing of the quasi-static strain elastic imaging equipment of the array scanning ultrasonic tomography system. The current product is applicable to circular array probes with an inner diameter of no less than 150mm. Other specifications can be customized according to its design concept.

Basic Structure

1. The appearance of the body model is roughly spherical. Its structural diagram is shown in the figure. The upper hemisphere of the sphere is an imitation breast structure, and the elastic target is embedded in the upper hemisphere. The lower hemisphere is a background elastic imitation tissue material.
2. The external surface of the body model material is packaged with a latex condom, and the space between the body model material and the latex condom is filled with maintenance liquid.
3. The dimensions of the body model: diameter 135mm, height approximately 120mm. The diameter of the imitation breast part is 135mm, and the height is approximately 70mm.



Technical Characteristics:

1. Sound velocity of background TM material: $(1540 \pm 10) \text{ m/s}$ ($23^\circ\text{C} \pm 3^\circ\text{C}$)
2. Sound velocity of cylindrical target material: $(1540 \pm 10) \text{ m/s}$ ($23^\circ\text{C} \pm 3^\circ\text{C}$)
3. Slope of sound attenuation coefficient for background TM material and target material: $(0.50 \pm 0.05) \text{ dB}/(\text{cm} \cdot \text{MHz})$ ($23^\circ\text{C} \pm 3^\circ\text{C}$)

(The above technical parameters are based on national standard GB10152 and medical industry standard YY/T-0937)

4. Backscatter: Target is lower than background (i.e., inner low and outer high);
5. Body model background TM material. At 23°C , shear wave velocity is $2.58 \text{ m/s} \pm 5\%$, and Young's modulus is $20 \text{ kPa} \pm 10\%$;

The target material in the body model is divided into two types. At 23°C , shear wave velocity is $1.29 \text{ m/s} \pm 5\%$ and $5.16 \text{ m/s} \pm 5\%$, and Young's modulus is $5 \text{ kPa} \pm 10\%$ and $80 \text{ kPa} \pm 10\%$ respectively.

6. The embedded target in the body model product is a short cylinder with a diameter of 16 mm, and the height is approximately the same as the diameter.

7. Position of cylindrical target: Two targets were placed near the depths of 20 mm and 45 mm from the top of the hemisphere (5 kPa target at 20 mm depth and 80 kPa target at 45 mm depth). The depth here is the distance from the center of the target to the midpoint of the body model top surface.