

FABRICATION OF RESOLUTION TARGETS FOR ULTRASOUND IMAGING.

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A new thin film test object for ultrasound calibration has been designed in the Electrical/Microelectronic Engineering Department. The device calls for a test pattern to be fabricated onto a thin film and used with existing ultrasound imaging systems to calibrate the system's performance. Candidate film had to be as uniform as possible as well as exhibit similar acoustic impedance to human tissue so that the areas of the film that were not patterned would remain transparent to the ultrasound system. Initial film candidates included polyvinylidene fluoride (PVDF), and parylene. In the end, parylene film was chosen due to its ease of fabrication given the available equipment. Film was fabricated through chemical vapor deposition onto silicon wafers. Thicknesses ranged from 14 μ m to 20 μ m. A metal etch mask was then deposited onto the film and a checkerboard pattern of 20 μ m x 20 μ m squares of any desired shape was then patterned and etched into the etch mask. The wafer was then etched using a reactive ion-etch process and the metal etch mask stripped. Test patterns include a figure E, a rectangle, and a plus sign. Further tests are planned using squares with varying distances, checkerboard patterns of varying width, as well as further investigation into the use of PVDF film as an alternative to parylene.