

Miscellaneous Applications

Package Types:

Smart cards, composites, LTCC substrates,

Inspection Standards:

- none -

Failure Types Commonly Detected:

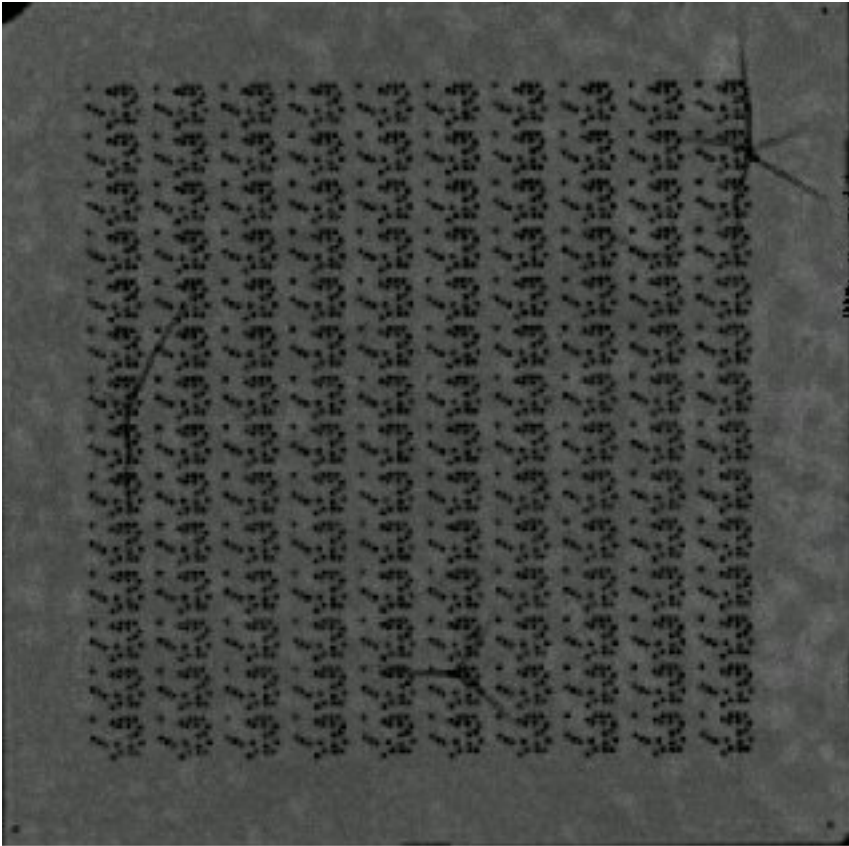
Non-bonded interfaces
Porosity measurements
Cracking
Impact damage
Thickness measurements
Acoustic research
Material characterization

Images:

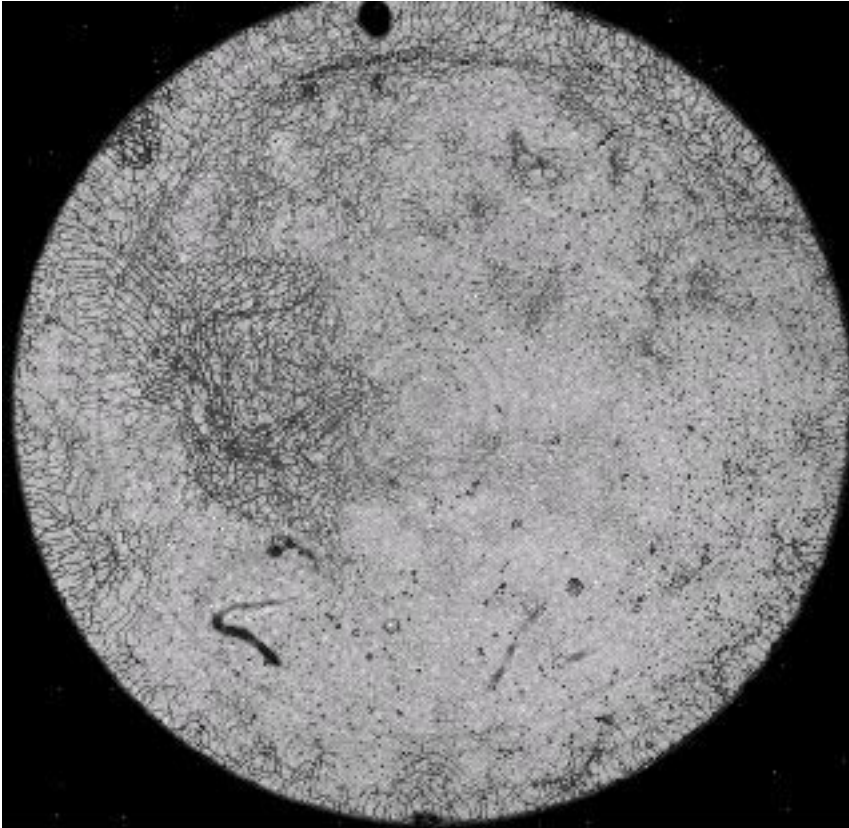


This is a pulse-echo image of a group of small piezoelectric (PZT) ceramic stripes. Each strip is used on a hard drive reader head. Black lines across several of the stripes indicate microcracks in the PZT material that were not visible optically. The

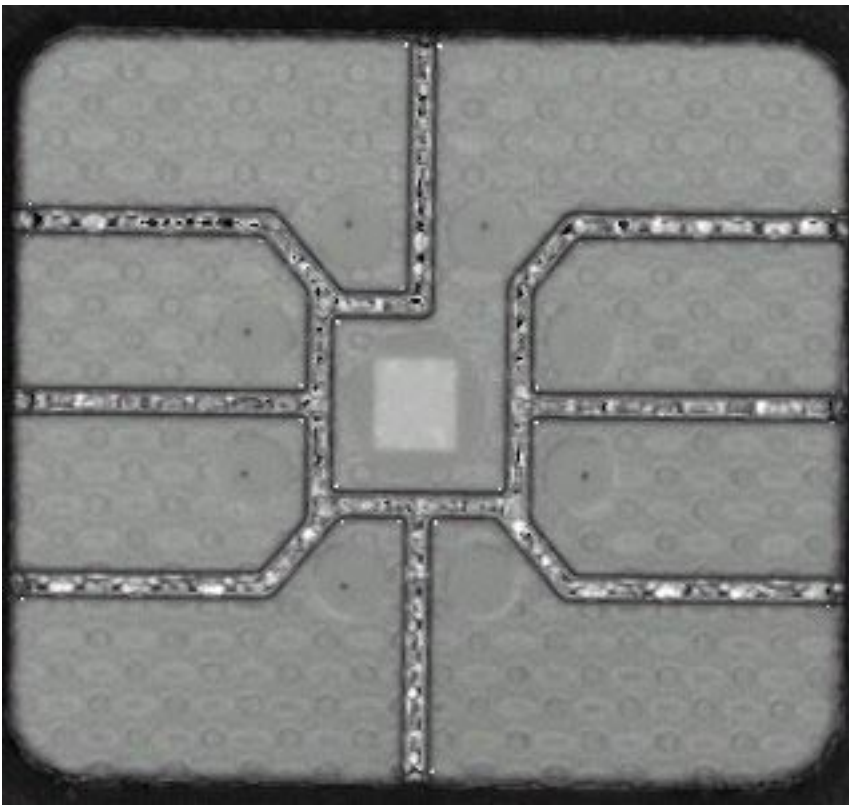
cracks were internal to the material and did not propagate to the surface. These cracks will cause the reader head to mechanically fail after stressing.



This is a pulse-echo image of a ceramic plate with laser machined holes. The image was generated using a Loss-of-Back-Wall technique. Black lines can be seen propagating from some of the holes. These are cracks as the result of an excessively long pulsewidth laser shot. Traditionally, Zygo or die-pentrate tests are performed to find these cracks, however cracks that don't reach the surface or are extremely small aren't seen in these test. SAM imaging identifies these cracks very easily.



This is a pulse-echo image of a beryllium oxide disk. The image was generated using a Loss-of-Back-Wall technique. Black areas signifies voids or cracks within the disk as the result of a manufacturing process that allows air pockets to be trapped in the material as it is being fired.



This is a pulse-echo image of a smart card. Small white areas in the square center can be seen. These signify die attach voids. Excessive void can mechanically and thermally compromise the device.