Meso-scale measurements with digital image correlation

Problem overview

Studying 4-10mm fields of view in 3D to determine strains in materials. Experimental results on bending of a sheet of paper are presented in the notes in Figure 1. Furthermore, Figure 2 shows the combined use of the ARAMIS technology with a microscope for even smaller fields of view.

Test setup

Notes

The current application showed that optical metrology has advanced capability for microelectronics. In this case, ARAMIS proved itself as a complete solution in one instrument, with countless applications for fields-of-view down to 100 microns. ARAMIS was successfully able to capture and analyze strain & displacement data from thermal cycling, fatigue, warpage and impact damage.

The MicroARAMIS setup shown above gave good results for 4-10 mm fields of view in 3D. A bending test (Figure 1) was performed on a sheet of paper which was patterned using an airbrush and major strain were computed. They were shown to reach 4% on the outer edge (in tension) and -1.2% in compression.

An even smaller field of view was achieved by using a microscope. Results were computed in 2D. Figure 2 shows the setup used in this case.

Conclusion

Optical metrology solution, such as the ARAMIS digital image correlation technology, were proven to be effective for meso-scale measurements in both 2D and 3D.

For more information on this application, please contact Trilion Quality Systems, world leader in custom optical metrology application development.

Keywords: *Meso-scale, microscope, small, microelectronic, DIC, microARAMIS, ARAMIS microscopy*

Figure 1

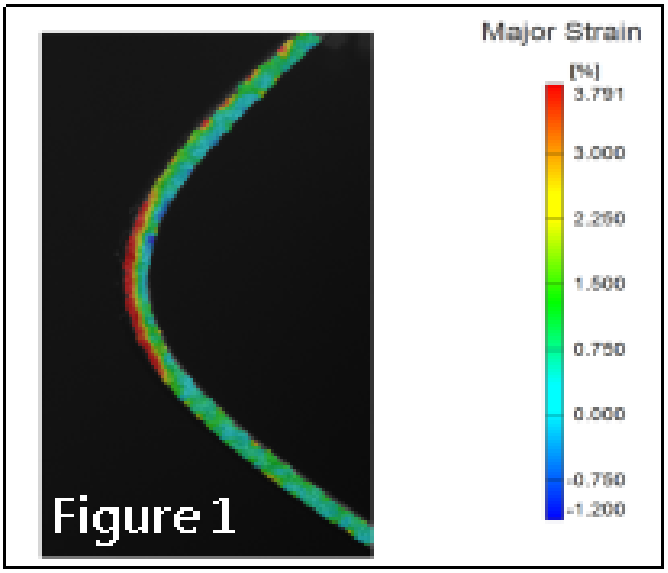

Figure 2