

An Automatic DIC Image Segmentation of Conductive Ball for an Anisotropic Conductive Film

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Anisotropic conductive film (ACF) is an adhesive film with conductivity that is used to connect various panels. It becomes growingly popular in electronic industries, because of its simple usage. Performance of the ACF is strongly related to the number, the location and the shape of conductive particles in thermoplastic resin. This information can be captured by microscopic images of panels with ACF. In general, differential interference contrast (DIC) microscopy is used to captures the images with particle indentations.

In this study, we develop an efficient automatic segmentation method for quantifying the performance of the ACF from the image with fuzzy approach. Fuzzy inference system is effective tool to handle ambiguous information form images spoiled by various sources from the image acquisition process. Therefore, particles are effectively extracted by using adequate fuzzy rule describing these features. Final segmented image is made through post-processing including morphological image processing. Finally, our segmentation algorithm demonstrates high accuracy when the results are compared with manual detections by experts. Consequently, the automatic analysis can provide objective and reproducible indentation detections within short time.