

Application of Inkjet Printing Technology¹

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Abstract

Printed circuits, sensors, electronics and radio frequency identification tags via liquid-based “ink” have received increasing interest in recent years. By using the functional fluid, inkjet printing technology is a promising method to deposit patterned metallic thin film structures on polymer substrates for use as electrical contacts, circuit elements or sensory elements. Our laboratory has specialized in development of new inks as well as standardization of the ink’s physical parameters to ensure reliability and reproducibility of the printed structures. We have developed a particle-free silver ink with superior electronic properties which is suitable for printing. Due to the absence of particles, the particle free silver ink will not clog an inkjet printer nozzle in most applications. Constantan ink is also developed which has excellent potential in mechanical sensing applications. Using a designed chemical process, stable constantan ink is formulated and constantan patterns are fabricated by inkjet printing. The growing demand for inkjet printing has led to a large number of available inks, each with varies properties and compositions. It has been our goal to develop a system of tests and measurements, in order to determine properties of inks – both commercially available or developed in our laboratory – which can be used as metrics for predicting ink performance. The system of tests and measurements enables us to create a database of inks and their properties, so that in the future, it will be easier to identify alternative inks for specific applications.

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