

Integration from Laboratory to Industrialization for Hybrid Printed Electronics

Authors : Ahmed Moulay, Mariia Zhuldybina, Mirko Torres, Mike Rozel, Ngoc Duc Trinh, Chloé Bois

Abstract : Hybrid printed electronics technology (HPE) provides innovative opportunities to enhance conventional electronics applications, which are often based on printed circuit boards (PCB). By combining the best of both performance from conventional electronic components and the flexibility from printed circuits makes it possible to manufacture HPE at high volumes using roll-to-roll printing processes. However, several challenges must be overcome in order to accurately integrate an electronic component on a printed circuit. In this presentation, we will demonstrate the integration process of electronic components from the lab scale to the industrialization. Both the printing quality and the integration technique must be studied to define the optimal conditions. To cover the parameters that influence the print quality of the printed circuit, different printing processes, flexible substrates, and conductive inks will be used to determine the optimized printing process/ink/substrate system. After the system is selected, an electronic component of 2.5 mm² chip size will be integrated to validate the functionality of the printed, electronic circuit. Critical information such as the conductive adhesive, the curing conditions, and the chip encapsulation will be determined. Thanks to these preliminary results, we are able to demonstrate the chip integration on a printed circuit using industrial equipment, showing the potential of industrialization, compatible using roll-to-roll printing and integrating processes.

Keywords : flat bed screen-printing, hybrid printed electronics, integration, large-scale production, roll-to-roll printing, rotary screen printing

Conference Title : ICFPE 2022 : International Conference on Flexible and Printed Electronics

Conference Location : Ottawa, Canada

Conference Dates : July 12-13, 2022