



FABRICATION OF ELECTRICAL CIRCUIT TRACES ON DIELECTRICS

Fast and cost-effective fabrication of circuits on plastic or glass.

Fabrication of circuit traces is the most challenging task in the production of Moulded Interconnect Devices (MID), being both technically difficult to achieve and difficult to make cost-efficient.

The Selective Surface Activation Induced by Laser (SSAIL) is a new technology for writing electronic circuits directly on dielectric material by modifying its surface properties with a laser has been developed in the Center for Physical Sciences and Technology in the frame of FP7 APPOLO project (www.appolo-fp7.eu). Lasers can write the circuits directly by modifying the surface of polymers followed by an electroless metal plating.

SSAIL is a three-step process: the first is surface modification by a laser; the second is chemical activation of laser-modified areas, and the last step is metal deposition by electroless plating. The new technology offers laser writing speed of up to 4m/s, and spatial plating pitch is kept as narrow as 25 μ m. This new technique for selective surface plating enables to use standard plastics without any special additives. It is alternative to the "Laser Direct Structuring (LDS)" technique which requires special additives to be mixed in the whole volume of the polymeric part. The additives increase the prices of the raw plastic material to 3-5 times. Thus, new SSAIL technology enables to reduce the processing cost at least three times compared with current technology used in industry. Moreover, SSAIL is capable metalise not only polymers but also glass.

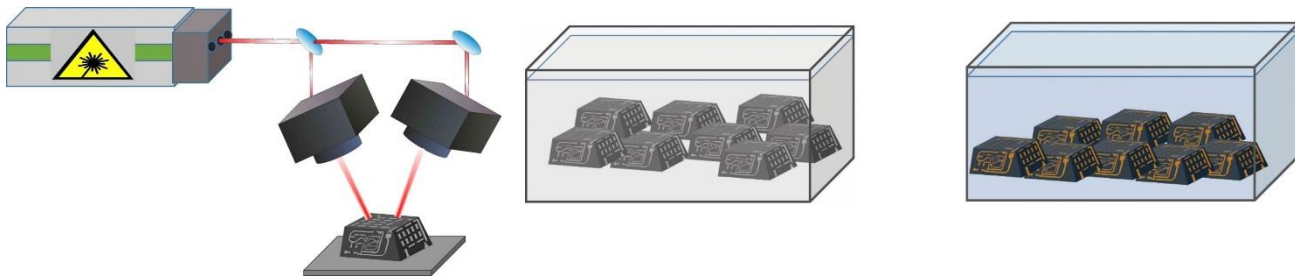


Fig. 1. Processing steps of SSAIL: laser modification; chemical palladium-free activation; electroless plating



Fig. 2. Demonstrator of SSAIL: FIAT 500 gloves box touch-sensitive opening mechanism; circuit design for data protection.