

Liquid Crystal Display (LCD) printing: a novel system for polymer hybrids printing

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Abstract.

Liquid Crystal Display (LCD) printing is a liquid based additive manufacturing (AM) technique that use a liquid crystal display and photocurable resins. LCD has many advantages over other AM techniques that ranges from low equipment cost to easiness of resin formulations. Mixing polymers with ceramics or metal particles can offer new potentials for the development of hybrids materials. Such blends might find interesting applications when the polymeric matrix is elidable by thermal sintering leaving a full ceramic or metal part. Such approach resemble those used in ceramic or metal injection molding but are more cheap and easy to run because they are out of the mold. Different printing parameters and slurry composition have been analyzed. The green printed parts were also analyzed by thermal gravimetry to determine the best sintering conditions. The sintered parts were then studied by scanning electron microscopy and by thermomechanical analysis. The results showed the importance of selecting properly the exposure time and the use of an automated wipe system during printing.