

Polcom Conference 2020

Abstract

Prof. Univ. Dr. Ec. Dumitru Nedelcu, "Gheorghe Asachi" Technical University of Iasi (TUIASI)

Additive Manufacturing of Biodegradable Materials Abstract



The global 3D printing market is growing at a very fast pace spreading both in the industrial and domestic environments due to their many valuable characteristics. The additive manufacturing technology it is projected to expand evenly in the coming years because is able to building up a part one layer at a time from different materials, and the materials field is also in a continuous development. It should be mentioned that this modern technology allows the reinforcement of printable materials with different reinforcements as metal powder, natural vegetable fibres, glass powder/microspheres, carbon fibre and so on. But, the main challenge is to create printable materials that physically and functionally meet today's needs, and here we refer mainly to the need of substitute nonbiodegradable materials with materials that can reduce the negative effect left by it's on the environment and beyond. In this sense researchers from around the world try to identify parts from different industrial branches that can be successfully substituted by the biodegradable materials, and which correspond to the criterion of the existing functionality and fulfill the companies need. The paper presents experimental results with reference to 3D printing of biodegradable materials such as: PLA, Impact PLA, HD PLA, Fiber Wood, Biofila, Extrudr BDP Pearl, Extrudr BDP Flax, Arboblend V2 Nature as base material and reinforced. The results will focus on mechanical properties including micro and nano indentation tests, Dynamic Mechanical Analysis, tribological properties, thermal and micro structural analysis. Take into account the results found in the scientific literature for different plastics, it can be concluded that the studied biodegradable materials have higher quality and properties that meet the technological demands, replacing successfully some plastics.