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Short Communication

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Use of robotic additive manufacturing for the shaping potentials lattice geometries from extruded biopolymers

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Abstract:

In the research carried out for the development of a robotic additive manufacturing process, rectangular prisms were manufactured from a biopolymer composed of water, glycerin and corn starch. In a first stage, experimental test benches were implemented to select the extruder components and also to define the raw material combination: starch percentage (15%, 20% and 25%) and glycerin percentage (0%, 15% and 30%). The material was extruded at two pressure levels and at five extruder speed levels, obtaining extrusion speed ranges, the rate of extruded material and the extrusion diameter of the material. In a second stage, these parameters were adapted to control the positioning of the extruded material by means of an 8DOF robotic platform, and thus define impressions with lattice-type shapes and topologies. Finally, when the manufactured parts were obtained, they were characterized dimensionally and mechanically by compression. The potential use of the strongest mixture, was selected to load a model active pharmaceutical ingredient, showing a low modification in the mechanical and geometrical effects of the final device.

Biography

César Bacca is a professional with projection in the use of agricultural resources as a sustainable source for obtaining materials, products and supplying energy demands. Master's degree and specialization studies focused on additive manufacturing, with biopolymers applied in the biomedical sector, use of polysaccharides to obtain packaging, alternative energies in agricultural centers, and mechanical design for food processing.

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