

Effect of Particle Size on Sintering Characteristics of Injection Molded 316L Powder

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Abstract : The application of powder injection molding technology for the fabrication of metallic and non-metallic components is of growing interest as the process considerably saves time and cost. Utilizing this fabrication method, full dense components are being prepared in various sizes. In this work, our effort is focused to study the densification behavior of the parts made using different size 316L stainless steel powders. The metal powders were admixed with an adequate amount of polymeric compounds and molded as standard tensile bars. Solvent and thermal debinding was carried out followed by sintering in ultra pure hydrogen atmosphere based on the differential scanning calorimetry (DSC) cycle. Mechanical property evaluation and microstructural characterization of the sintered specimens was performed using universal Instron tensile testing machine, Vicker's microhardness tester, optical (OM) and scanning electron microscope (SEM), energy dispersive spectroscopy (EDS), and X-ray diffraction were used. The results are compared and analyzed to predict the strength and weakness of the test conditions.

Keywords : powder injection molding, sintering, particle size, stainless steels

Conference Title : ICSME 2016 : International Conference on Structural and Materials Engineering

Conference Location : Kuala Lumpur, Malaysia

Conference Dates : February 11-12, 2016