

Mechanical Properties of Selective Laser Sintered 304L Stainless Steel Powders

Authors : Shijie Liu, Jehnming Lin

Abstract : This study mainly discussed the mechanical properties of selective laser sintered 304L stainless steel powder specimen. According to a single layer specimen sintering, the microstructure and porosity were observed to find out the proper sintering parameters. A multi-layer sintering experiment was conducted. Based on the microstructure and the integration between layers, the suitable parameters were found out. Finally, the sintered specimens were examined by metallographical inspection, hardness test, tensile test, and surface morphology measurement. The structure of the molten powder coated with unmelted powder was found in metallographic test. The hardness of the sintered stainless steel powder is greater than the raw material. The tensile strength is less than the raw material, and it is corresponding to different scanning paths. The specimen will have different patterns of cracking. It was found that the helical scanning path specimen will have a warpage deformation at the edge of the specimen. The S-scan path specimen surface is relatively flat.

Keywords : laser sintering, sintering path, microstructure, mechanical properties

Conference Title : ICIMMS 2019 : International Conference on Industrial, Mechanical and Manufacturing Science

Conference Location : Tokyo, Japan

Conference Dates : January 07-08, 2019