World Academy of Science, Engineering and Technology
International Journal of Mechanical and Mechatronics Engineering
Vol:12, No:08, 2018

Molding Properties of Cobalt-Chrome-Based Feedstocks Used in Low-Pressure Powder Injection Molding

Authors : Ehsan Gholami, Vincent Demers

Abstract : Low-pressure powder injection molding is an emerging technology for cost-effectively producing complex shape metallic parts with the proper dimensional tolerances, either in high or in low production volumes. In this study, the molding properties of cobalt-chrome-based feedstocks were evaluated for use in a low-pressure powder injection molding process. The rheological properties of feedstock formulations were obtained by mixing metallic powder with a proprietary wax-based binder system. Rheological parameters such as reference viscosity, shear rate sensitivity index, and activation energy for viscous flow, were extracted from the viscosity profiles and introduced into the Weir model to calculate the moldability index. Feedstocks were experimentally injected into a spiral mold cavity to validate the injection performance calculated with the model.

Keywords : binder, feedstock, moldability, powder injection molding, viscosity
Conference Title : ICMMME 2018 : International Conference on Mechanical, Materials and Mechatronics Engineering
Conference Location : Vancouver, Canada
Conference Dates : August 09-10, 2018