Evaluation of hardness and density properties of sintered Inconel 718 using palm oil-based binder

ABSTRACT

This paper investigates the effect of palm oil-based binder on hardness and density of sintered Inconel718. Palm stearin (PS) is the palm oil derivative, which has been formulated and evaluated as possible alternative binder system. The variety of PS contents can be an advantage during debinding process as it can be removed gradually to maintain the shape of the debound part. At different heating temperatures, each binder contents melts, leaving different impurities. The remaining impurities help to form capillary holes for the removal of the binder material. The PS binder system is compared with conventional binder system based on the physical and mechanical properties of Inconel718 sintered parts. It was found that the PS binder systems proved to enhance the properties and improve the microstructure behaviour. Result shows that the sintered properties from palm oil binder system can be achieved in accordance to the Metal Powder Industries Federation standard.

Keyword: Binder system; Density and microstructure; Hardness; Palm stearin; Powder Inconel 718; Sintered parts