

Solvent debinding of Inconel 718 fabricated via Metal Injection Molding

ABSTRACT

The demand for components manufactured by Metal Injection Molding (MIM) has been increased due to a diverse range of applications on the high temperature mechanical properties and corrosion/oxidation resistance. Super alloy utilize the inherent physical properties of heat-resisting alloy based on iron-nickel, or cobalt specifically high purity and fine particle size distributions, which can enhance sintering and maximize the density of the final component. The development of super alloy Inconel 718 (IN718) using MIM is discussed. IN718 powder with binder formulation consists of polyethylene (PE) / palm stearin (PS) were mixed homogeneously and injected to produce green compacts. The binders then were removed through solvent extraction process from various heating temperature and duration of time. The binder removal was quantified by weight loss measurements and the evolution of pore structure for the debound specimens was observed using scanning electron microscope (SEM). Result shows that complete extraction of PS from the green parts can be concluded during 60 °C of heating and 6 hours of immersion in heptane.

Keyword: Powder inconel 718; Binder system; Molding; Debinding