Karakterisasi feedstock metal injection molding (MIM) menggunakan torsi mixing = Characterization of feedstock metal injection molding (MIM) using mixing torque

Aldino Muhamadwijaya, author

Abstrak

ABSTRAK
Dalam kehidupan sehari-hari hampir di semua tempat terdapat barang-barang yang diproduksi dengan proses metal injection molding seperti pesawat telepon, printer, keyboard, mouse, rumah lampu mobil, dashboard, roda furnitur, telepon seluler, dan masih banyak lagi yang lain. Secara garis besar proses produksi komponen melalui jalur teknologi logam serbuk dengan proses Metal Injection Molding terdiri atas empat tahapan yaitu mixing, injection molding, debinding dan sintering. Feedstock (bahan baku) memainkan peran sentral dalam proses MIM. Feedstock yang merupakan campuran antara powder dan binder yang dicampur (mixing) pada temperatur elevasi menggunakan bantuan alat seperti ekstruder, kneader atau shear roll extruder, dengan ketersediaan berbagai perangkat pencampuran telah menambah variasi metode yang berbeda dari pencampuran yang akan digunakan untuk menghasilkan feedstock MIM . Terlepas dari metode pencampuran digunakan, campuran bahan baku harus homogen dan memiliki perilaku pseudo-plastik. Dalam proses MIM, laju geser selama molding biasanya berkisar antara 100 dan 10000 s-1. Dalam rentang laju geser ini menurut teori viskositas maksimum untuk injeksi molding adalah 1000 Pa.s pada suhu molding
Untuk mencari karakterisitik rheologi dari feedstock biasanya diukur menggunakan Capillary Rheometer, pada skripsi ini penulis menggunakan data mixing untuk mencari nilai shear rate dan viskositas, hasil penelitian menunjukkan bahwa perbandingan hasil perhitungan dengan rheologi Material Safety Data Sheet (MSDS) tidak terlalu besar, lalu feedstock Fe2%Ni dengan binder 69%BW+30% EVA + 1%SA dan feedstock Fe2%Ni dengan binder 79%PW+20%HDPE + 1% SA memenuhi syarat rheologi sebagai feedstock Metal Injection Molding.
<hr>
ABSTRACT
In daily life almost everywhere there are goods produced by metal injection molding process such as a telephone, printer, keyboard, mouse, house lights, car dashboard, wheel furniture, mobile phones, and many others. Broadly speaking, the process of production of components through the powder metal technology with Metal Injection Molding process consists of four stages, namely mixing, injection molding, debinding and sintering. Feedstock plays a central role in the MIM process. Feedstock which is a mixture of powder and binder were mixed at a temperature elevation using the help of tools such as extruder, kneader or shear roll extruder, with the availability of various mixing devices have extended variety of different methods of mixing that will be used to produce MIM feedstock. Apart from mixing method is used, a mixture of feedstock should be homogeneous and has a pseudo-plastic behavior. In the MIM process, the shear rate during molding is usually between 100 and 10 000 s-1. Within the range of shear rates is in theory a maximum viscosity for injection molding was 1000 Pa.s at molding temperatures
Find characteristic rheological of feedstock is typically measured using a capillary rheometer, in this paper

the authors use data mixing to find the value of shear rate and viscosity, the results showed that the comparison of the calculation results with rheological Material Safety Data Sheet (MSDS) is not too large, then feedstock Fe2 % Ni with a binder 69% BW + 30% EVA + 1% SA and feedstock Fe2% Ni with a binder of 79% PW + 20% HDPE + 1% SA qualifies as feedstock rheological Metal Injection Molding.