

Fabrication of 316L stainless steel parts by injection moulding for biomedical application using a novel binder

ABSTRACT

This paper focuses on the usage of a novel binder system base on palm oil product to produce sintered parts of stainless steel 316L produced by vertical injection molding technique for biomedical application. The stainless steel 316L powder was mixed using z-blade mixer with the thermoplastic binder system comprising of polyethylene, paraffin wax, stearic acid and palm stearin which was derived from palm oil at different volume percent (%). The feedstock then was studied in term of viscosity and shear rate using capillary rheometer. The feedstock was molded using vertical injection molding machine. After molding, the green molded part was immersed into the solvent to extract part of the binder system followed by sintering under vacuum atmosphere at the temperature of 1360 degrees C. The physical and mechanical properties of the sintered part such as density, hardness, shrinkage, ultimate tensile strength and elongation were measured. Biocompatibility study of in vitro test using cell osteosarcoma MG-63 was observed and discussed.

Authors:	Ibrahim, R. ; Omar, M. A. ; Goh, W. C. ; Mohamad, M. ; Muhamad, S. ; Yahya, N. A. ; Radzi, Z. ; Abu Kasim, N. H.
Book:	3rd Kuala Lumpur International Conference on Biomedical Engineering 2006
Year:	2006
Pages:	102 – 105

KEYWORDS :

binder system; palm stearin; stainless steel; 316L; injection molding

PLEASE CITE AS:

Ibrahim, R., M. A. Omar, et al. (2007). **Fabrication of 316L stainless steel parts by injection moulding for biomedical application using a novel binder**. 3rd Kuala Lumpur International Conference on Biomedical Engineering 2006. F. Ibrahim, N. A. A. Osman, J. Usman and N. A. Kadri. Kuala Lumpur, SPRINGER, 233 SPRING STREET, NEW YORK, NY 10013, UNITED STATES. **15**: 102-105

URL :

- http://books.google.com.my/books?id=IDQ32fqu2okC&pg=PA102&lpg=PA102&dq=Fabrication+of+316L+stainless+steel+parts+by+injection+moulding+for+biomedical+application+using+a+novel+binder&source=bl&ots=-d-gP0sP4&sig=5yPUVcKwR4tdJIRMImsr58MhySE&hl=en&ei=U23hTqyWGYjirAei7-iGAQ&sa=X&oi=book_result&ct=result&resnum=1&ved=0CDMQ6AEwAA#v=onepage&q=Fabrication%20of%20316L%20stainless%20steel%20parts%20by%20injection%20moulding%20for%20biomedical%20application%20using%20a%20novel%20binder&f=false
- <http://www.springerlink.com/content/tu14281I7gu56457/>