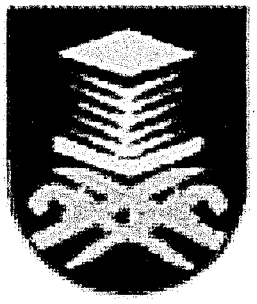

CHARACTERIZATION OF OPTIMAL POWDER LOADING FOR METAL INJECTION MOULDING (MIM)

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ABSTRACT

Metal injection moulding (MIM) is a relatively new manufacturing process for the large scale net shape forming of high integrity and multifunctional metal parts. Actually, this type of process is very new in Malaysia and still not applied commercially in industry. Because of many processing steps involve in MIM, there is ample opportunity for defects to be created. Thus at every major processing step in the operation, it is necessary to characterize the material being processed from the initial powders and binders to the final sintered component. This study attempts to investigate the effect of tailored particle size on powder packing density. In MIM, before the powder can be mixed homogeneously with binder, several characteristics of the powder and binder should be clarity understood. So that the part produced have a higher packing density. In this study, concentration is given to the characterisation of metal powder to obtain the optimal powder loading. Thus, characterisation will be based on the standard of ASTM and Metal Powder Industries Federation (MPIF) such as powder shape, size and particle distribution, density, tap density, apparent density, Pcynometer density, and critical powder loading. Two different mean particle sizes of 316L stainless steel powder were used. 16μm and 22μm. it has been shown that by increasing on mean particle size will increase in packing density. This is believe due to experiment have done that coarser particle size will result higher packing density. Therefore the optimal powder loading can be obtained by 2% to 5% less than critical powder loading.

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CHAPTER 2 LITERATURE REVIEW