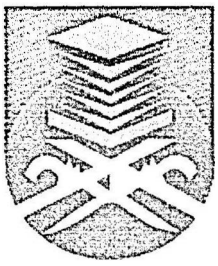

RHEOLOGICAL STUDY OF MIM WATER SOLUBLE BINDER SYSTEM

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A thesis submitted in partial fulfillment of the requirement for the award of Bachelor Engineering (Hons) Mechanical

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OCTOBER 2004

ACKNOWLEDGEMENT

Alhamdulillahi Rabbul A'lamin.
With the name of Allah the Al-Mighty.

I am truly relief with the completion of this task. On this special opportunity given to me, I am grateful to express my gratitude to my supervisor, Encik Muhammad Hussain bin Ismail on his invaluable cooperation, guidance, support and his encouragement from the start until the end of this thesis to ensure that it would turn out well and in accordance with the course requirement.

Secondly, I would also like to thank to the following individuals who have helped me with significant information, excellent suggestion and advice in completing this thesis. I want to thank for those people for their valuable time and effort. They are Prof. Madya Hj. Mohd Muhiddin Ahmad, Program Chief of Diploma/Bachelor of Polymer Technology, Faculty of Applied Science, Encik Ahmad Zafir bin Romli, Lecturer of Polymer Technology, Faculty of Applied Science and Encik Ahmad Kambali Khalil, Laboratory Technician, Faculty of Applied Science.

I also like to thank to SIRIM for giving the support on doing this project and to other individuals that have directly or indirectly given their support and contribution towards the success of this thesis. May Allah shower his blessing on all of you. Besides, I would like to express my personal word of thanks and special appreciation to my family members and not forgetting to my colleagues for their encouragement, time and

ABSTRACT

Although many methods are used for characterization of Metal Injection Moulding (MIM) parts, but the process of metal injection molding (MIM) has provided an alternative for the manufacture to produce small and complex parts. MIM is an acronym for metal injection molding, a process for manufacturing metal parts. MIM combines the design freedom of plastic injection molding with the performance of metal. This research will provide an introduction to metal injection molding by briefly reviewing the basic process steps by using a composite binder system whose main constituents are polyethylene glycol (PEG), which are water soluble binder system. This also covered Hostamont EK 583, a ready made binder and finely dispersed polymethyl methacylate (PMMA). Besides, feedstock at three different PEG % weight binder composition; 65%, 75% and 85% powder loading were studied in order to find the best homogeneity of feedstock. From the results, it shows that the increasing of the PEG % composition would increase the viscosity. The lower the value of viscosity is, the easier it is for a MIM feedstock to flow. Result also shows that the flow of the feedstock is found as pseudoplastic flow and at the composition of PEG 75% posses the best homogeneity feedstock.

TABLE OF CONTENTS

CHAPTER I

INTRODUCTION

1.0 BACKGROUND

Nowadays, new applications of parts and materials place new demands on manufacturing techniques. Generally, variety of techniques and methods are used for each manufacturing process. Besides the cost or economical consideration, time also is the main aspect in the production process, which a good production needs to be done in a short time with a low cost.

MIM is a new powder metallurgy technique, which has developed over the last ten years into a serious competitor to the classical production methods such as fine casting, stock machining and stamping. Today, MIM is an internationally recognized and used production method, which is supported by an extensive set of ISO standards.

MIM is a new production method for metal parts. It opens new possibilities for designers and product developers to use it for an economical production of complex metal parts. MIM has been used to form complex shape forming ability. Complex shapes that are produced using MIM process can be formed inexpensively to nearly full-density through the use of a polymer-powder combination (Norhamidi et al. 1999). Therefore, there are not necessary to any secondary machining process.