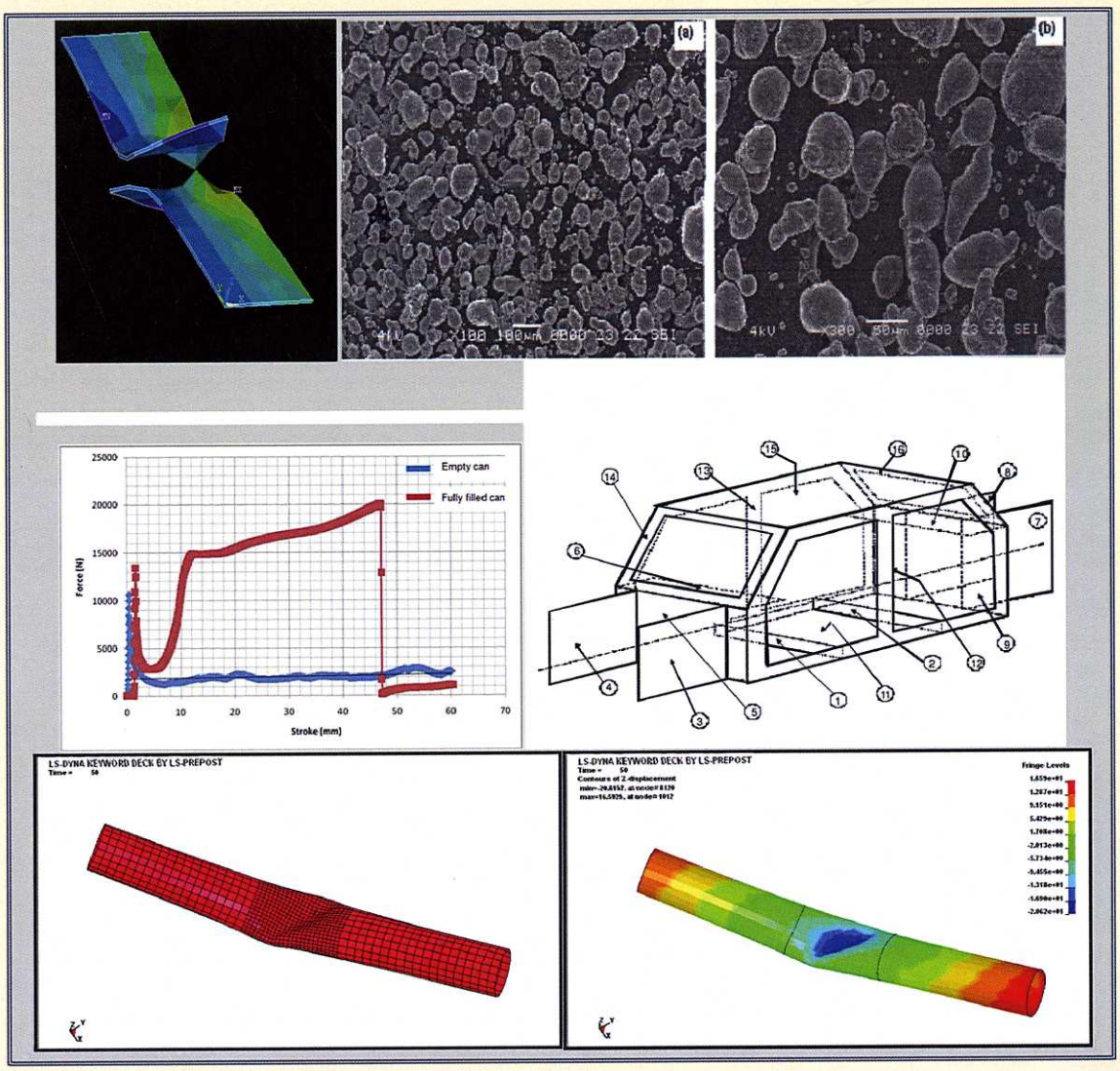
ADVANCED TOPICS IN MECHANICAL BEHAVIOR OF MATERIALS



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Meftah Hrairi

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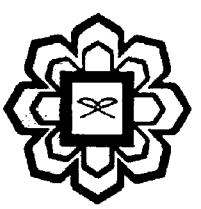

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OVERVIEW OF THE POWDER METALLURGY PROCESS

Meftah Hrairi, Asmu'i Hussin, Fadzly Mohamad Ravi

1. INTRODUCTION

Powder Metallurgy (P/M) is on the leading edge of new manufacturing processes for improved product quality and productivity. It is a cost-effective method of forming precision net-shape metal components that allows for more efficiently designed consumer and industrial products. The P/M industry continues to invest heavily in new technology to improve the properties of P/M products. One of the major goals for the conventional P/M industry is to increase the density to match the properties of wrought materials. New materials containing chromium, silicon and other non-conventional alloy systems were developed for higher performance. New lubricant systems are being developed for higher densities and enhanced properties, closing the gap with wrought materials [1].

2. PROCESSES OF POWDER TECHNOLOGY

The general process used in PM requires multiple steps (Figure 1): manufacturing of the powder, selection and conditioning of powders to create desired alloys, compaction to generate a semi-finished product possessing the necessary size and shape for the finished product, sintering of compacts to improve their mechanical properties and, in some applications, additional processes necessary for the finishing of the sintered parts into a final product.