

**UNIVERSITI TEKNOLOGI MARA**

**Investigation Of Jolt Squeeze Machine  
Specifications For Dumbbell Design  
Productions And Its Characterizations**

**MUHAMMAD DANISH HAIKAL BIN HAMZAH**

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## ABSTRACT

This project explores the use of jolt squeeze machines in foundries to produce sand molds and its relevance to dumbbell design production. Jolt squeeze machines are ideal for small-scale and batch production of castings. However, they are not currently utilized in Personal Knowledge Management (PKM) due to the need for students to learn the basics before exploring advanced techniques and this project aims to highlight the machine's capabilities and demonstrate its suitability for use by PKM students. Additionally, this project examines the machine's parameters and their effects on molding sand. By using this machine, the molding sand can be compacted easily and efficiently, resulting in consistent products. The project investigates the machine's significant factors that contribute to the production of dumbbell designs with varying specifications. Ultimately, the project provides valuable insights into the use of jolt squeeze machines for sand mold production and their potential for use in PKM.

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# **CHAPTER 1**

## **INTRODUCTION**

### **1.0 Introduction**

#### **1.1 Background of Study**

The jolt squeeze machine has a significant background rooted in the history of foundry and metal casting processes. It emerged as a solution to overcome the limitations of manual mold-making techniques and to improve the quality and efficiency of metal castings.

The origins of the jolt squeeze machine can be traced back to the early 20th century when foundries were predominantly reliant on manual labor for creating molds. Workers would use their hands or handheld tools to compact sand around a pattern, creating the mold cavity for the molten metal. This process was time-consuming, labor-intensive, and often resulted in inconsistencies and defects in the final castings.

Recognizing the need for a more efficient and standardized method, engineers and inventors began experimenting with various mechanical devices to automate the sand compaction process. This led to the development of the jolt squeeze machine, which combined two distinct actions: jolting and squeezing.

The jolting action involved applying a high-energy shock or impact to the mold flask filled with sand and pattern. This jolt helped to settle the sand particles, removing airvoids and ensuring better density. The squeezing action, on the other hand, involved applying pressure to further compact the sand, enhancing mold strength and stability.

By incorporating these two actions into a single machine, the jolt squeeze machine offered several advantages over manual methods. It provided more uniform and consistent compaction of the sand, resulting in improved mold quality and dimensional accuracy. The elimination of air voids reduced the risk of defects such as porosity and improved the

overall integrity of the castings.

The jolt squeeze machine quickly gained popularity in foundries worldwide. Its introduction brought about a significant transformation in the metal casting industry, increasing productivity, and reducing the reliance on manual labor. The machine allowed foundries to produce molds at a faster rate, enabling higher casting volumes to meet the growing demands of industrial applications.

Over the years, advancements in engineering and technology have led to further refinements and enhancements of the jolt squeeze machine. Modern iterations of the machine often feature automated controls, improved vibration mechanisms, and ergonomic designs for ease of use. These advancements have made the jolt squeeze machine even more efficient, reliable, and versatile in various foundry settings.

Today, the jolt squeeze machine remains a crucial tool in metal casting processes, particularly for producing medium to large-sized castings. It continues to play a vital role in industries such as automotive, aerospace, machinery, and construction, where high-quality castings are essential.

The background of the jolt squeeze machine highlights its evolution as a solution to overcome the limitations of manual mold-making techniques. It stands as a testament to the ingenuity and innovation of engineers and inventors who sought to improve the efficiency, quality, and productivity of metal casting processes.

The project aims to study the specifications and characteristics of a jolt squeeze machine for designing dumbbells. The research focuses on specific parameters of the jolt squeeze molding machine. The choice of dumbbell design is based on its availability on campus.