



**DESIGN AND DEVELOPMENT OF LINEAR TECHNOLOGY IMPACT  
SIMULATOR TEST EQUIPMENT**

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## **ABSTRACT**

This thesis is written to understand the design and development of the linear technology impact simulator test equipment. The thesis is a final year project for Faculty of Mechanical Engineering student and it is an industry-based project for PROTON. It is also project collaboration with Asian Autotec Sdn. Bhd. (ATEC). I have chosen Asian Autotec Sdn. Bhd. (ATEC) as my partner as they have given me the opportunity to explore design and develop linear technology impact simulator test equipment. My thesis starts with the understanding of linear impact simulator test equipment concept. In general, an impact test is a test for determining the energy absorbed in fracturing a test piece at high velocity. In studying linear impact simulator test equipment, the components consist of several parts that include the frame, base, structure, main bar and the secondary bar. Besides that, calculation required in the designing of linear impact simulator test equipment is also carried out. I use this calculation as a guide to design the linear technology impact simulator test equipment. After designing the linear technology impact simulator test equipment, development stage takes place. Development stage begins after the first testing was done in order to see whether the linear technology impact simulator test equipment has fulfilled the requirements given by PROTON. In this development stage, I change some of the initial design in order to achieve the objectives of this project. This stage was done with supervision of Asian Autotec Sdn. Bhd. and PROTON. Cost of the project is one of the main considerations during the designing and development stage. ATEC has given me the range of budget to work with and it must not exceed this budget. Finally, I hope this thesis will be extended to other project students who are interested to explore further in the design of linear technology

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## **CHAPTER I**

### **INTRODUCTION**

#### **1.1 Background on Impact Testing**

Impact testers are among the first instruments that plastics compounders, extruders, and molders consider when outfitting a lab. Historically, the choice between traditional falling-weight and pendulum impact testers seemed relatively simple. It was determined by the material, end-use application requirements, and the customer's preference for a particular type of test data. These traditional instruments remain popular due to their simplicity, affordability, and long history of use. What's more, many material suppliers, compounders, and additive master batch suppliers are turning to instrumented impact tests that use devices outfitted with load sensors, which provide more detailed information about materials' response to impact loads.

Impact testing is easily defined as testing an object's ability to resist high-rate loading. An impact test is a test for determining the energy absorbed in fracturing a test piece at high velocity. Think of it as one object striking another at an incredibly high speed. Impact tests are one of the most important pieces of information an engineer or designer has to consider. Impact resistance is also, without a doubt, one of the most difficult properties to quantify. The impact resistance of a part is a critical measure of