



# **AIR CURTAIN DESIGN FOR COLD ROOM**

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## **ABSTRACT**

The project work is to design the air curtain to maintain the cold room temperature in the range of  $-28^{\circ}\text{C}$  by employing Computer Fluid Dynamic (CFD) in the conceptual design. Besides the calculated design method, this project attempts to utilize CFD technology, effectively acquiring the design result and user-friendly for fabricator to utilize it. The design must also consider the standard specification in order to fulfill the desire requirement.

The conceptual design of the air curtain for the cold room will be compare the available parts specification that is available in the market to ensure that it can be fabricate with the available equipments in the market. Thus this has given the opportunity to understand the integration of design theory, especially in design engineering.

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## **CHAPTER I**

### **INTRODUCTION**

#### **1.1 Background**

In the process of designing air curtain, one has adhered to certain laws such as the fan law. The design must also consider whether the parts are available in the market and the new design must follow the required specifications, namely to design air curtain for cold room entrance and maintain the cold room temperature at  $-28^{\circ}\text{C}$ .

CFD (Computational fluid dynamic) by using PHOENICS software is used to analyze and determine the suitable velocity for designing a workable air curtain.

An opened door separating a cold storage area from a warm room permits a substantial loss of refrigerated air. Warm air flows into the cold room through the lower part. This results in energy losses, safety hazards in the form of condensation and icing on the floor and fog in the doorway; and possibly food spoilage. Strip doors used on coolers and freezers to reduce these effects impair visibility and are unpleasant to pass through due to condensation and frosting. They also accumulate dirt and possible bacterial growth.

#### **1.2 Problem description**

The air curtain is design for IGLO Sdn. Bhd, which has twenty seven ( 27) cold room. The doorway is 3 m width, as indicated in Figure 1.1. The air curtain