

Design of an Air Blower System For Fuel Cells

A Major Qualifying Project Submitted to the Faculty of Worcester Polytechnic Institute In partial fulfillment of the requirements for the degree in Bachelor of Science In Mechanical Engineering

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Abstract

Partial Emission (PEM) Pumps, otherwise known as Barske Pumps, are a niche variant of centrifugal pumps first developed for aerospace applications during World War II. PEM pumps are especially valuable in this specific industry due to multiple critical factors including low costs to manufacture, involving lightweight materials, and maintaining consistent efficiency at varying pressures and temperatures. This MQP set out to build a mathematical model that would take a set of physical PEM pump characteristics and calculate a suite of essential variables and factors. This tool would allow the sponsoring team to check how modifying these characteristics would affect efficiencies, losses, and other factors, reducing the number of prototypes they must manufacture for testing.