

**DEVELOPMENT OF A FRACTIONAL DISTILLATION SYSTEM
FOR THE CONVERSION OF WASTE-ALCOHOL TO PURE
ALCOHOL FUEL**

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Project Report
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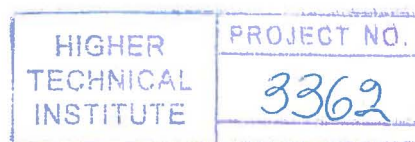
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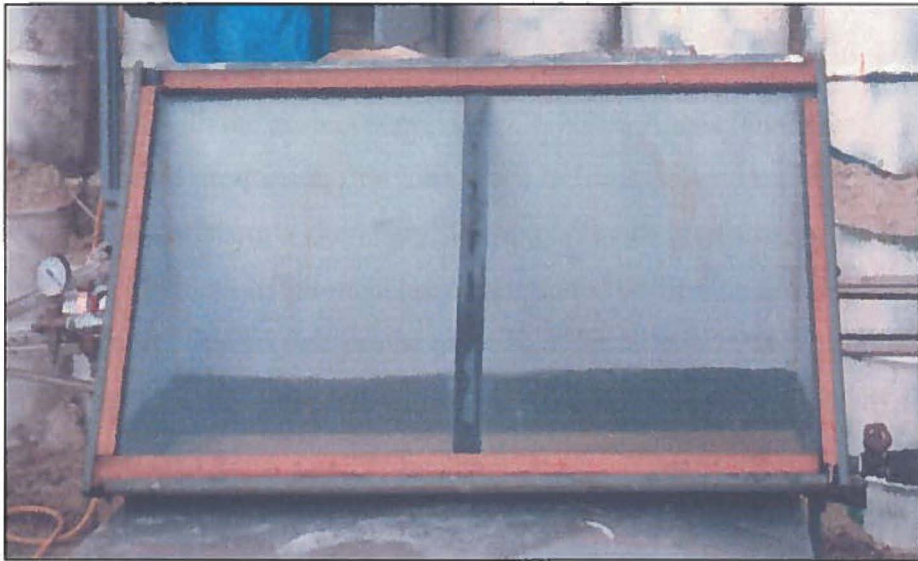
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PROJECT'S TITLE

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ABSTRACT

The primary objective of this project is to produce ethanol from waste alcohol, which can be found in alcohol industries here in Cyprus, by using the method of solar fractional distillation. The idea of ethanol production is widely spread over the technologically improved countries and researches are already in progress to find a way of using the product ethanol in many cases. The most common case in which ethanol could be used for many reasons explained later is “fuel ethanol”, which as it is obvious is about ethanol used in our automobiles.

The initial idea of this project was established by Mr. Demetris Lordos, and with the cooperation with the project supervisor Dr. Nicos Angastiniotis the experiments on ethanol production first took place in Limassol and then continued in other places such as Carlsberg’s chemistry. The experiments are focusing not much in the theory of solar distillation, but most are concentrated on finding a way of correct distillation, and improvements that can be made in order to have better results.

So, in order to perform the experiments we moved at Lordo’s company for the first experiments on pure solar distillation, and then we moved to Carlsberg’s breweries for some more scientific experiments. The whole procedure of the experiments done are in the next pages giving much information on ethanol, ways of distillation and our experiments on solar ethanol distillation.

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I am grateful to my supervisor Dr. Nicos Angastiniotis for his guidance and help during the research for the project, and for giving me some useful ideas on where i could find useful information about this project. Also, like to thank Mr. Demetris Lordos for his excellent idea on solar distillation and my classmates that have been there for me making me laugh when i had so much work to do and i was tired. And special thanks, to my girlfriend Yioula, who had the patience to put up with me the, and my brother Andreas, who studies computer science and helped me a lot with the typing of the project.

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INTRODUCTION

General idea

In our century the technological rise is increasing in very fast rhythms with a general purpose of better conditions of living.

In this effort, the scientists are trying to develop new ideas to improve the ease of living and not only, but to make our lives for comfortable with all our needs to be satisfied. But, in order to improve our lives we are causing other problems. For example, the design and construction of the car has made our lives easier.

But from these designs there is a general problem coming through. All these facilities in order to work need some kind of energy, for example diesel, where this kind of energy is almost in shortage from the earth. And, in order to prevent our selves from staying without diesel or petrol for the rest of our lives and drop any equipment uses diesel to work, it is better to find a way of producing an alternative form of diesel/petrol before it disappears.

So, this project is suggesting a way of producing an alternate kind of fuel, which can be used, instead of using 100% diesel or petrol, to be used as a mixture in order to reduce the use of diesel/petrol or even better, to make use only of the new fuel. In this case we need to find a way to produce ethanol, which is the most important form of alcohol and can be used in a mixture as an alcohol fuel. The ethanol can be acquired from many sources such as corn or other, but in our case the production of ethanol will be acquired from waste alcohol.

The whole procedure of how the new fuel is produced will follow in the next pages giving detail explanations on how to construct any device that will help us make the production available. Also some experimental measurements and tests will be reported and finally a general cost optimization will follow.