

ΟΝΟΜΑΤΕΠΩΝΥΜΟ ΦΟΙΤΗΤΗ: ΘΕΟΦΑΝΟΥΣ ΤΑΣΟΣ

**ΤΙΤΛΟΣ ΕΡΓΑΣΙΑΣ: «ΒΕΛΤΙΣΤΟΠΟΙΗΣΗ ΘΕΡΜΟΣΙΦΩΝΙΚΟΥ ΦΑΙΝΟΜΕΝΟΥ
ΣΕ ΕΠΙΠΕΔΟ ΗΛΙΑΚΟΥ ΣΥΛΛΕΚΤΗ ΜΕ ΤΗΝ ΧΡΗΣΙΜΟΠΟΙΗΣΗ ΤΗΣ
ΜΕΘΟΔΟΥ ΣΧΕΔΙΑΣΜΟΥ ΠΕΙΡΑΜΑΤΩΝ (DOE, ΜΕΘΟΔΟΙ TAGUCHI)»**

Abstract

The present dissertation titled «Optimization of the thermosyphon phenomenon at the level of the solar collector through the use of the experiment design method (DOE, Taguchi methods)», took place during semesters 7 and 8. The aim of the present project is the effort for optimizing the thermosyphon phenomenon in an experimental way. There are many factors playing important part in this phenomenon and we have examined the most important of them. The research of the optimization was experimental since a number of experiments through the Taguchi method were performed in order to limit their final number. The experimental set up was designed and built in such a way, so as to examine the factors which we believe to play the most important part at the optimization of the thermosyphon phenomenon.

In the first chapter there is a short presentation of the energy problem and its causes. Next there is a reference of the Alternative Energy Sources and the way their use can lead to the beginning of the solution of our planet's ecological problems. Later there is a reference at the solar heating systems, as well as the categories of the solar collectors and panels. After that there is a short historical review of the use of the solar energy in Cyprus.

In the second chapter there are various projects and studies relevant to the main topic of the dissertation and the way this thesis differs from those projects and researches.

In the third chapter there is a detailed reference to the solar water heater, for the heating of the water, an analysis of its function through the use of the two natural phenomena. Next there is an analysis of the output of the solar collector, as a measurement of its proper function.

In the fourth chapter there is a detailed theoretical presentation of the solar water heater. Next there is a choice of a number of parameters which were examined in order to optimize the thermosyphon phenomenon. Following there is a presentation of the experimental order used, as well as the use of experiments through the Taguchi method.

In the fifth chapter there is a description of the Minitab statistics program used in this project. There is a detailed reference of the choice of the parameters which optimize our system, through the use of this program.

Finally in the sixth chapter we present our conclusions and in the seventh chapter the bibliography used for our project.

