

**AN EXPERIMENTAL STUDY ON THE
FLEXURAL PROPERTIES OF GLASS
FIBER REINFORCED CEMENT**

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PROJECT REPORT

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C H A P T E R 1

INTRODUCTION

Problem

Nowadays, the building industry in Cyprus is completely depended on concrete. One of the most common problems that most constructions have in Cyprus is the early shrinkage of concrete.

Plain concrete composed of sand gravels¹ (aggregates) and cement, is a brittle material with a low tensile strength and strain capacities. These abilities of concrete have let to problems such as plastic shrinkage cracking and settlement cracking during the first 24 hours after placement.

This is a big problem, in this beautiful island, since the climate is very dry and expansion and contraction is a common phenomenon. Also, Cyprus being in the Mediterranean Sea, where the soil in these territories is mostly soft clay, with the variation of temperature, concrete leads to cracking. Another factor that plays an important part to this problem is the fact that fault constructional materials are often used, since there are a lot of projects in process and there is not enough time for a proper check.

Importance of the study

In order to overcome these problems, studies of research and testing have been made during the last thirty years with the use of fiber reinforced cements and concretes (F.R.C.).

These tests have shown that the addition of fiber glass to plastic concrete substantially increases the resistance of the concrete to early age plastic shrinkage cracking and cracking in response to vibration at early ages. Also a fiber increases the strain capacity (ability to resist strain without developing visible cracking) of the immature concrete. This is particularly important since a large amount of the cracking of concrete occurs during the 24 hours after the concrete has been placed when the concrete is most susceptible to vibration, plastic shrinkage and settlement cracking.

The aim

These tests have proved that fiber glass reinforcement (F.R.C.) has such properties which give applications and solutions to various structural and architectural difficulties and problems.

Limitation

In this project it must be taken into account that the bibliography and information of glass fiber reinforced concrete (GFRC) was limited, since glass fiber is a new product and only a few companies, in Cyprus, are acquainted with this product.

Moreover, only a few project with the use of fiber glass reinforcement have been established and what the result will actually be in the next fifty years is not known.

In addition the experimental time for this project in the labs was limited as well. More samples and tests could have been made in order to have better comparing results. Also the shrinkage elongation test and vebe flow table test comparing plain and fiber glass reinforced concrete was not achieved due to short length of time and not enough materials available.



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