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## Porosity and Strength of Pozzolan Modified Cement Systems

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### Abstract

Porosity is one of the important properties that determine the durability of concrete and mortar. Porosity represents the amount of voids inside the concrete, which is dimensionless quantity, usually expressed as a percentage value. This aim of this study is to determine the effect of pozzolans such as pulverized fly ash (PFA) silica fume (SF) on the porosity and strength of mortars. The mix proportion with and without pulverized fly ash (PFA) and silica fume (SF) are tested with two properties such as strength and porosity in order to understand the effect against performance of the mortar. In addition, curing condition also does affect the strength and porosity of the modified mortar. The results from this study shows that the pozzolan modified mortar which is the sample with pozzolan replacement, has low in durability and higher porosity compared with non-modified mortar when it is cured under air curing, which is the method of curing that usually been applied at the construction site.

*Keywords: Porosity; Strength; Pozzolan; Mortar; Air curing; Fly ash; Silica fume*

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### 1. Introduction

Durability is the capacity of concrete to resist deterioration caused by environment, human activities and also forces from loading that occupy a structure. It normally refers to the duration or life span of the concrete itself. The service life and durability of a concrete structure strongly depend on its material transport properties, such as permeability, sorptivity, and diffusivity which are controlled by the microstructural characteristics of concrete [1]. There are many properties of concrete that is related to its durability such as absorption, strength and workability. It is known that the porosity is the critical components of the microstructure of hydrated cement paste that influence durability. Porosity is the volume of voids that occupy a concrete. In order to achieve high strength,

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