

## Using Geopolymer Technology on Stabilization and Reutilization the Expansion Behavior Slag

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**Abstract :** Basic Oxygen Furnace (BOF) Slag and electric arc furnace (EAF) slag is the by-product of iron making and steel making. Each of slag with produced over 100 million tons annually in Taiwan. The type of slag has great engineering properties, such as, high hardness and density, high compressive strength, low abrasion ratio, and can replace natural aggregate for building materials. However, no matter BOF or EAF slag, both have the expansion problem, due to it contains free lime. The purpose of this study was to stabilize the BOF and EAF slag by using geopolymer technology, hoping can prevent and solve the expansion problem. The experimental results showed that using geopolymer technology can successfully solve and prevent the expansion problem. Their main properties are analyzed with regard to their use as building materials. Autoclave is used to study the volume stability of these specimens. Finally, the compressive strength of geopolymer mortar with BOF/FAF slag can be reached over 21MPa after curing for 28 days. After autoclave testing, the volume expansion does not exceed 0.2%. Even after the autoclave test, the compressive strength can be grown to over 35MPa. In this study have success using these results on ready-mixed concrete plant, and have the same experimental results as laboratory scale. These results gave encouragement that the stabilized and reutilized BOF/EAF slag could be replaced as a feasible natural fine aggregate by using geopolymer technology.

**Keywords :** BOF slag, EAF slag, autoclave test, geopolymer

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