The Influence of Sintering on the Mechanical and Thermal Properties of Fly Ash and Clay-Based Composites

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Talk Abstract

Clay, widely available in Morocco, has been thoroughly studied for its diverse applications, particularly in the construction industry [1]. This study investigates the effects of sintering on the physical and mechanical properties of clay, both in its natural state and when mixed with varying amounts of fly ash. Fly ash, a byproduct of coal combustion, is known to enhance the mechanical properties of composites when used as an additive in construction materials [2] and [3]. Using a range of analytical techniques, including compression tests and measurements of density, porosity, and volume shrinkage, we aim to provide a detailed understanding of the changes induced by sintering, especially with the addition of fly ash. Our results indicate a significant correlation between increasing sintering temperatures and the improvement of key mechanical properties [4]. Specifically, we observed increases in Young's modulus, compressive stress, density, and volume shrinkage as the sintering temperature rose. Concurrently, a consistent decrease in porosity was noted, highlighting the complex interactions that affect the material's characteristics. These findings contribute to a deeper understanding of the synergistic effects of sintering and fly ash incorporation on clay-based composites [5]. This knowledge is crucial for optimizing the performance of these materials in various applications within material science and engineering, where precise control of sintering dynamics is essential.

Keywords: Clay, Fly Ash, Porosity, Mechanical Properties, Physical Properties, Volume Shrinkage.

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