

# JOINT E-CONFERENCE ON RENEWABLE ENERGY AND SUSTAINABILITY & GEO SCIENCE AND GREEN TECHNOLOGY MARCH 15-16, 2023 | WEBINAR



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### Fresh and mechanical performance of engineered cementitious composite includes High and Low calcium fly ash.

This paper presents the performance of Engineered Cementitious Composites (ECC) that contain high percentages of fly ash. ECC is a newly developed high-performance fiber-reinforced cementitious composite with substantial benefits in both high ductility in excess of 3% under uniaxial tensile loading and improved durability due to intrinsically tight crack width. For this concrete mix was designed as ECC-45. The polyvinyl alcohol (PVA) fiber with a fraction of 2% was used in the research. Two different PVA-ECC concretes were produced using low lime fly ash (LCFA) and high lime fly ash (HCFA) with a fly ash-to-OPC ratio of 1.2. The effect of Fly ash on the fresh properties and setting time of ECC mixes were evaluated. The mechanical properties were also conducted by evaluating the compressive strength and flexural tensile strength. Scanning electronic analysis (SEM) was also conducted to clarify the bond strength of PVA fibers within the matrix of ECC specimens. The research findings demonstrated that ECC includes high calcium fly ash exhibits less workability than ECC includes low calcium fly ash. The mechanical performance of specimens including high calcium fly ash exhibits mechanical performance much more than low calcium fly ash due to the high bond strength between the PVA fibers and ECC matrix.

**Keywords:** Engineering Cementitious Composite, High calcium fly ash, High calcium fly ash, Compressive strength, and Flexural tensile strength.