

## MACRO MECHANICAL PROPERTIES OF ULTRA HIGH PERFORMANCE CONCRETE USING GROUND GRANULATED BLAST SLAG AND NANO TITANIUM DIOXIDE

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### ABSTRACT

Concrete is the predominant and most frequently used building material with a world wide annual material flow of 20-25 billion tons. Ultra high performance concrete (UHPC) is an emerging high-tech building material, when compared to conventional concrete it allows more slenderness and increased durability in reinforced concrete structures. UHPC differs from conventional concrete because it consists of fine materials like quartz sand, quartz powder, silica fume. In this study, UHPC is produced with nano material to achieve target compressive strength more than 180MPa. Micro structural properties of concrete depends on curing regimes. In this, water curing and thermal curing is used. Cube specimens of size 70.6mm\*70.6mm\*70.6mm and cylindrical specimen of size 100mm dia\*200mm high were cast and they are exposed to a temperature of 200°C in oven for duration of 24, 48 and 72 hours at the age of third day followed with water curing till 28 days. Because of variation in nano material compressive strength ranges from 105 MPa to 185 MPa. From this study, it is observed that, nano material, quartz sand, curing regimes affects the compressive strength and maximum compressive strength is achieved when 4% nano Titanium dioxide is used.

**KEYWORDS:** UHPC, Micro Structural, Quartz Sand, Quartz Powder, Nano Titanium Dioxide