

# **Experimental Investigation on the Effect of Elevated Temperature on Compressive Strength of Concrete Containing Waste Glass Powder**

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## **Abstract**

This study examines the effect of elevated temperature on the strength of concrete containing glass powder (GWP) as Ordinary Portland cement replacement. The cement was partially replaced by 0, 15, 18, 21, 24, 27 and 30 % of GWP and samples were prepared at constant water-binder ratio of 0.5. The cube samples after curing in water for 90 days were exposed to 60, 150, 300 and 500°C temperatures increased at a heating rate of 10°C/min. Compressive strength values were measured on unheated samples and after air-cooling period of the heated samples. A scanning electron microscope (SEM) analysis was carried out on selected samples to examine alterations in the matrix and interface. The results indicate a decrease in the compressive strength with increasing temperature, and significant alteration was observed in the concrete matrix and interface from the SEM analyses. However, the results indicate that concrete samples containing 21% GWP exhibit higher strength compared to control.

**Keywords:** waste glass powder (GWP), compressive strength, SEM, elevated temperature, sustainability

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