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## COMBINED EFFECT OF FLY ASH AND GLASS FIBRES ON MECHANICAL PERFORMANCE OF CONCRETE

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### Abstract:

Poor performance in tension and high carbon footprint are two major drawbacks of plain cement concrete (PC). Both of these issues can be minimised by using fibres and pozzolanic binders (as partial replacement of cement) in concrete. This paper investigates the combined influence of fly ash (FA) and glass fibre (GF) on mechanical properties of concrete. A total of nine concrete mixtures were prepared and tested using two replacement percentages of FA (twenty percent and forty percent) by mass of cement with two volume fractions of GF (0.25 percent and 0.5 percent). Mixes of plain concrete (PC) were used as reference mixes. Compressive strength, split tensile strength and flexural strength of the mixes were determined at 28 days and 90 days. The results indicated that although FA concrete mixes had lower mechanical strength at 28 days although the strength of these mixes became higher compared to the reference mix after 28 days. Addition of GF caused significant improvement in split tensile and flexural strengths of concrete whereas compressive strength changes only slightly. GF also helped in recovering strength loss of FA concrete mixes at 28 days. The mixes with twenty percent FA and 0.25 percent GF provides better results compared to PC mixes.

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