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(57) Abstract :

This invention introduces an innovative approach to reinforcing cement concrete with marble dust, aimed at enhancing its mechanical properties for broader application in construction. By optimizing marble dust within the concrete matrix, the invention achieves significant improvements in compressive strength, contributing to more durable, sustainable, and economically viable construction materials. This invention introduces a cement concrete composite material incorporating strategically oriented marble dust as fine aggregates to enhance mechanical properties significantly. Through rigorous testing, it was demonstrated that cement concrete reinforced with marble dust achieved a 14 % increase in compressive strength at 28 days of curing, reaching 35.6 N/mm², compared to 31.5 N/mm² for conventional concrete. These empirical enhancements, underpinned by detailed graphical analyses, establish this invention's potential to revolutionize concrete reinforcement with a focus on sustainability, durability, and mechanical performance.

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