

Study on the Effect of Nano-Silica in Mechanical and Durability Properties of Concrete with Steel Fiber

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Abstract: *This study presents experimentally the combined effect of using Nano-silica (NS) and steel fibers (SF) on the mechanical properties of hardened concrete. NS is used as partial cement replacement by different percentages, and SF is used as volume substitution by different percentages. Splitting tensile strength, modulus of elasticity, and flexural strength are evaluated using different combinations between NS and SF. Significant improvement in the mechanical properties of concrete is observed on using NS due to its high pozzolanic activity. The Optimum content of SF is improved splitting tensile strength with different percentages respectively compared to without either NS or SF. Utilizing NS with SF leads to improving modulus of elasticity compared to without either NS or SF. Flexural strength is doubled for using NS and SF compared to without NS and SF.*

Keywords: Nano-Silica, Steel Fibers, Mechanical Properties and Durability.

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