

Effect of Fiber Types and Elevated Temperatures on the Bond Characteristic of Fiber Reinforced Concretes

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Abstract : In this paper, the effects of fiber types and elevated temperatures on compressive strength, modulus of rupture and the bond characteristics of fiber reinforced concretes (FRC) are presented. By using the three different types of fibers (steel fiber-SF, polypropylene-PPF and polyvinyl alcohol-PVA), FRC specimens were produced and exposed to elevated temperatures up to 800 °C for 1.5 hours. In addition, a plain concrete (without fiber) was produced and used as a control. Test results obtained showed that the steel fiber reinforced concrete (SFRC) had the highest compressive strength, modulus of rupture and bond stress values at room temperatures, the residual bond, flexural and compressive strengths of both FRC and plain concrete dropped sharply after exposure to high temperatures. The results also indicated that the reduction of bond, flexural and compressive strengths with increasing the exposed temperature was relatively less for SFRC than for plain, and FRC with PPF and PVA.

Keywords : bond stress, compressive strength, elevated temperatures, fiber reinforced concrete, modulus of rupture

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