

Mechanical Properties, Energy Impact Capacity and Bond Resistance of concrete incorporating waste glass powder

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Abstract. The present study is investigated about effect of glass waste as powder as partial replacement of cement in some properties of concrete. These properties included compressive strength, splitting and flexural tensile strengths, impact resistance and bond strength. The effect of glass as powder was examined by compared to control specimens without glass powder replacement. Three percentage were tested: 0%(control), 10 and 15%. Results showed that using glass powder improved properties of concrete under different type of loading. Compressive strength increased by 26.34% and 22% when compared it with control mix for 10% and 15% glass powder, respectively. While splitting tensile strength increased by 23.5% and 28.7% more than control mix for 10% and 15% glass powder, respectively. And modulus of rupture increased by 17% and 10% for 10% and 15% glass powder, respectively. The impact resistance of mixes 10% and 15% of glass powder were increased by 14.3% and 4.76 % in compression with control mix, respectively. Finally glass powder also improve bond strength where the ultimate bond strength increased by 4.7 % and 6.2 % for 10% and 15% glass powder respectively. Then the utilization of waste glass as powder in concrete reduced amount of cement and improved its resistance to load.