

EFFECT OF IRON POWDER (Fe₂O₃) ON STRENGTH, WORKABILITY, AND POROSITY OF THE BINARY BLENDED CONCRETE

Ajay Kumar Das¹,

¹UG Student, Department of Civil Engineering,
Coimbatore Institute of Engineering and Technology, Coimbatore, Tamilnadu, India

V.Nandakumar²

²Head of Department, Department of Civil Engineering, Coimbatore

In this study, the effect of iron powder (Fe₂O₃) on the compressive strength, tensile strength, workability, and porosity of the binary blended concrete were experimentally investigated. For this purpose, Portland cement was partially replaced by 1.5%, 2.5%, 3.5%, and 5% by weighing of iron powder. The amount of water-binder-ratio was considered constant. The workability of the fresh composite concrete was determined using cone Abrams method; mechanical properties were determined included compressive and tensile strengths at 7, 14, and 28 days and durability evaluated by water absorption and permeable porosity. It was observed that the compressive and tensile strengths change with the replacement of iron powder by up to 5%. However, the maximum improvement was gained at 2.5 wt% for compressive strength and 1.5 wt% for tensile strength. The workability of the fresh mixtures decreased when iron powder amount increased. It was observed that the porosity decreased respectively by 21.88% and 26.77% at 1.5 wt% and 2.5 wt% replacement. Moreover, this present study shows the importance and benefits to improve concrete properties by using micro-particles materials.