

PROPERTIES OF AN EAF SLAG PRODUCED IN GREECE: A CONSTRUCTION MATERIAL FOR SUSTAINABLE GOWTH

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ABSTRACT

Iron and steel slag, a non metallic coproduct of iron and steel production, have been used commercially since at least the 19th century. Slags find use in road and railroad construction, cement production, soil amendment, water purification, and permeable reactive contaminant-barriers. Here, we discuss the characteristics of Greensteel S.A. EAF slag aggregates produced in Volos and Aspropyrgos. The slag is basic, and CaO- and FeO+Fe₂O₃-rich; PAHs are absent; radionuclides are present but not a health threat; heavy metals exceed published soil background data but compare well to published data for limestones. Theoretical considerations, leaching tests, K_d , and R values suggest long-term environmental stability. The 4/12 & 10/16 fractions have a mean apparent density of 3.52 Mg/m³, a mean grain density of 3.33 Mg/m³, an average WA_{24} of 1.6%, and a 5% apparent porosity. Average MD_E , MD_S , LA , and V_{LA} values are 8, 4, 17, and 1. FI and SI vary from 1.5 to 10. PSV and AAV range from 53 to 68 and 1.3 to 2.8, correspondingly. Sand (0/4) SE and MB values are 74% and 0,25 g/kg with an apparent grain density of 3,67 Mg/m³, a dry grain density of 3.52 Mg/m³, a WA_{24} of 1.1%., and E_{cs} equal to 23 s. Finally, the all-in 0/32 aggregate has SE values >50, a low MBV , non-plasticity, a low MS value, and corrected for oversize material $\rho_{dry\ max}$ and w_{opt} of 2.64 g/cm³ and 6.4%, respectively.

KEY WORDS: EAF slag, composition, properties.