

Carbon Burn-Out - A State of the Art in Commercial Ash Beneficiation

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ABSTRACT

Carbon Burn-Out (CBO) combusts residual carbon in fly ash, producing a very consistent, low carbon, high-quality pozzolan. The process is continuous and is fueled solely by the residual carbon. Heat is recovered and sent back to the power plant that originally produced the high-carbon fly ash.

Commercial applications of CBO include the Wateree Station of South Carolina Electric and Gas (in service 1/99) and Winyah Station of Santee Cooper (in service 9/02). Each processes roughly 200,000 tons of fly ash per year and both have operated at very high capacity since coming on line. Over 1,000,000 tons of premium CBO ash have been produced and sold.

While increased carbon in fly ash as a result of low NO_x burners was the original driver for application of this technology, additional environmental factors are becoming more of an issue. EPA's actions to further reduce NO_x, SO₂ and mercury emissions from coal fired boilers are accelerating interest in the application of this technology. CO₂ emissions are similarly increasing interest in CBO since the product ash is used as a substitute for Portland cement, a leading contributor to the greenhouse gas emissions. CBO is also effective at removing ammonia residue from contaminated ash with no changes in process. In addition, virtually all mercury, which comes in with ash fed to the CBO, reports to the product ash, which in turn winds up encapsulated in concrete.

This paper updates information about the operational experience of both the Wateree and the Winyah CBO plants.

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