Converting Coal Prep-Waste to Portland Cement

Javed I. Bhatty, F. M. Miller, and John Gajda

Construction Technology, Laboratories, Inc., 5400 Old Orchard Road, Skokie, Illinois 60077

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ABSTRACT

This paper describes the use of coal prep-waste in producing portland cement. Coal prep-waste, together with cement kiln dust (CKD), were incorporated into cement raw feed and pyropocessed to produce cement clinker. The use of prep-waste was maximized as a source of silica, alumina, and iron in the raw feed, whereas the residual coal in the prep waste served as a supplementary fuel. Sulfur in prep-wastes combined with alkalies in CKD to produce clinker with somewhat higher sulfate content than the normal clinkers. The clinker was ground without gypsum, which is normally otherwise required in cement finish grinding. The ground clinker was blended with cement produced in the normal fashion to produce portland cement compliant with ASTM Specification C 150.

Almost 15% each of prep-waste and CKD were used in the raw mix for making cement clinker. The clinker was fired at a reduced temperature of 1400^{o}C, 50°C below that normally required in commercial production. The clinker was ground and blended with commercial cement to produce ordinary cement for evaluation. The cement exhibited chemical and physical properties comparable with those of commercial cement, when tested for compliance with ASTM Specification C 150.