JIANGXI YADONG CEMENT CORPORATION LTD

New refractory bricks/castables for different zones of cement rotary kiln system to reduce heat loss

SUMMARY OF THE OPTION

Jiangxi Yadong Cement Corporation is a joint-venture producing Portland cement and located in Jiangxi Province, China. The company has two 4200T/D KHD pyrorapid short kilns. Each rotary kiln is 52 meters long, and its external diameter is 4.8 meters. The kiln lining is made of refractory material bricks, and in between the refractory material bricks and the kiln shell, there is a layer of high strength heat insulating bricks. Presently, most of which are spinel ferrite bricks. Based on in situ measurements, the Team found that the temperature at both ends of the kiln shell was about 200-300^{0}C, and that in the central part the temperature was about 250-400^{0}C. In addition, five cooling fans were installed blowing cold air to cool the driving gear and the tyres to protect them.

With the technical support of international experts, the Team suggested trying new refractory bricks/castables at different zones of cement rotary kiln system to reduce heat loss. For example, 40-50% alumina bricks/high strength insulating bricks to be used at calcining zone; 60-70% alumina bricks, or basic bricks (60-70% MgO), or periclase spinel bricks, or alumina zircon bricks at transition zone; 70% alumina bricks, or mag - chrome bricks, or dolomite bricks at burning zone; abrasion resistant high alumina (70-80% $A1_2O_3$) bricks, silicon carbide based shapes at discharge zone (including cooler spouts), etc.

However, this option was rejected, as management did not have enough confidence in the option, mainly due to the uncertainty of the benefits. Management believes it is not easy to reduce heat losses drastically in the kiln, as even in cement plants in developed countries, the surface temperatures of most cement kilns are within the range of 250-350^{o}C. Furthermore, this option requires a large investment (because the consumption of insulating bricks is about 300 tons per year, and consumption of refractory material is about 20 tons per year). In addition, there are other environmental concerns for some refractory materials. For example, even though chrome-magnesium bricks have a better insulating capacity, the company does not want to use these, as the heavy metal chrome is poisonous to the environment and humans.

KEY WORDS

Cement, China

FOR MORE INFORMATION

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