

Redesign and supply of kiln refractories

RMS were tasked to redesign and supply the refractories for a kiln roasting Stibnite (Antimony sulphide).

The Problem

This is a greenfield site situated in the Middle East, with world first technology for producing Antimony in an environmentally responsible manner. The roasting process utilises a kiln configuration and was originally designed as a conductive design. The refractories utilised were not lasting and failed, replaced with alumina chrome refractories during an emergency repair. However, the process was not efficient with off gas temperatures lower than what is required for Antimony Trioxide fuming.

Client Request

Design a kiln that structurally eliminates refractory movement and is insulating with a maximum shell temperature of 250°C. In addition, the discharge chambers were also to be designed with maximum insulation.

Solution

RMS designed a dual lining for the kiln, using a unique tongue and groove design. The lining hot face utilises a phosphate bonded high temperature fired alumina chrome refractory.

The inlet chamber refractory quality was also changed to an alumina chrome castable, that was specifically designed for base metal applications. The discharge chamber was designed as a dual brick backed with a fibre board. A unique brick anchor was designed and installed to stabilise the hot face refractory.

Results

The design was completed and approximately 260 tonnes of refractories was supplied and installed under RMS supervision. During the first two months of operation, kiln shell temperatures have remained well below 250°C, with off gas temperatures exceeding the expectations of the client.

The brick design has shown no movement or loosening as was experienced with previous linings.



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