Smelting Furnace Melt Zone Wall Modification to Cope Higher Production Rate Operation

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Abstract

PT Smelting adopts Mitsubishi Continuous Technology for its copper smelter plant which has been operating since 1998. Through a series of expansion projects, the plant production capacity increased gradually from 200,000 to 300,000 ton copper yearly. There are no significant modification works for smelter plant to get 50% additional capacity. It was mostly achieved by intensifying furnaces operation by increasing oxygen content in the furnaces blowing air.

Intensive smelting furnace operation caused shorter life of some furnace refractory, especially melt zone wall at furnace outlet side. At each furnace relining, which is done once in every two years, severe wall erosion was found. The worst condition occurred in year 2007 when the smelting furnace got melt leakage through eroded wall beneath bath-line cooler. In 2008 furnace relining, a modification was done by installing vertical coolers behind the melt zone wall. The additional vertical coolers were installed in 2012 furnace relining to extend the coverage area. The modification can improve melt zone wall healthiness significantly for keeping them safely within two year campaign life.

Recently a modeling study was done to estimate characteristic of molten wave against furnace wall erosion. The study has aim to predict the impact of blowing parameters such as blowing air velocity towards the melt wave character and wall erosion.