

Air Classification of Dust from Steel Converter Secondary De-dusting for Zinc Enrichment

Authors : C. Lanzerstorfer

Abstract : The off-gas from the basic oxygen furnace (BOF), where pig iron is converted into steel, is treated in the primary ventilation system. This system is in full operation only during oxygen-blowing when the BOF converter vessel is in a vertical position. When pig iron and scrap are charged into the BOF and when slag or steel are tapped, the vessel is tilted. The generated emissions during charging and tapping cannot be captured by the primary off-gas system. To capture these emissions, a secondary ventilation system is usually installed. The emissions are captured by a canopy hood installed just above the converter mouth in tilted position. The aim of this study was to investigate the dependence of Zn and other components on the particle size of BOF secondary ventilation dust. Because of the high temperature of the BOF process it can be expected that Zn will be enriched in the fine dust fractions. If Zn is enriched in the fine fractions, classification could be applied to split the dust into two size fractions with a different content of Zn. For this air classification experiments with dust from the secondary ventilation system of a BOF were performed. The results show that Zn and Pb are highly enriched in the finest dust fraction. For Cd, Cu and Sb the enrichment is less. In contrast, the non-volatile metals Al, Fe, Mn and Ti were depleted in the fine fractions. Thus, air classification could be considered for the treatment of dust from secondary BOF off-gas cleaning.

Keywords : air classification, converter dust, recycling, zinc

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