Zinc from Secondary Sources

EZINEX® Process

Title: Zinc Extraction from EAF Dust with EZINEX® Process

Paper presented at: Elektrolyseverfahren in der Metallurgie GmbH; November 19th-21st, 1997; Lunen, Germania

Authors: Dott. Ing. Marco Olper - Engitec Impianti S.p.A. – Novate Milanese, Italy

Abstract: EZINEX®, an acronym derived from "Engitec Zinc Extraction" was developed by Engitec Impianti S.p.A. of Milan, Italy. The basis of the process is metallic zinc recovery performed by a hydrometallurgical system. Research was started on a laboratory scale where various zinc containing materials from different sources – electric arc furnace (EAF) dust from steel works, Waelz oxides, oxides from converters, zinc ashes – were tested.

In August 1003, a pilot plant capable of treating 500 tons of EAF dust per year was erected at a major Italian steel mill belonging to the Pittini Group. The plant, Ferriere Nord, with a 800,000 t/y steel capacity, is located near Udine, Italy. The pilot plant treatment capacity was designed to allow for an accurate scale-up of the design of a commercial plant. The pilot plant was equipped with all fundamental operations for the process; specifically, a full industrial size and capacity cell performed the electrolysis process.

Research was conducted during an 8-month (20 days/month operating schedule) period where enough data were accumulated to tests the process with EAF dusts of varying compositions and Waelz oxides. The results allowed Engitec to determine the optimal operating conditions and the appropriate construction materials for EZINEX®, to define and produce samples of all products and by-product. Specifically, Engitec verified the quality of the electrolytically deposited zinc, which reached, under optimised conditions, a high purity level.

The first industrial plant based on the EZINEX® process to treat the full quantity of EAF dust generated by the steel mill, is in operatiion from January 1996 and is located at the Ferriere Nord site. It has a nominal treatment capacity of 12,000 tons per year. After one year of operation the EZINEX® process has demonstrated its technical and economical viability.