

RECYCLING LADLE SLAG AS SLAG FORMER FOR EAF STEELMAKING – A STUDY OF FOAMING BEHAVIOUR

M.Guzzon¹
C.Mapelli¹
V.Sahajwalla²
N. Saha-Chaudhury²
F.Memoli³
M.Pustorino⁴

ABSTRACT

Several steel plants, in Italy and in the rest of Europe, recycle with different methods and techniques the slag proceeding from the secondary metallurgy as slag former for their Electric Arc Furnaces.

In this paper the excellent results of this non-standard practice are analysed and related to the characteristics of the EAF-slag resulting from this recycling. An interesting effect has been found on the characteristics of foaming velocity, slag basicity and slag density.

Slag foaming studies were conducted in the laboratories of UNSW (Sydney,Australia) using the high temperature visualization facility. The studies have established the differences in the slag foaming phenomenon between the electric arc furnace slag formed with usual components (lime, dololime, etc.) and the slag formed with the non-standard mix (lime and recycled ladle slag).

Using a model of isothermal solubility, developed by Politecnico di Milano University (Italy), the other EAF slag properties, in particular the density and the basicity, are correlated to the saturation of silicates, aluminates and other complex components of the secondary metallurgy slag into the EAF slag.

The results of these studies confirm that this particular type of ladle slag recycling is viable, as it does not affect the EAF foaming properties, and in some cases it is even more favourable than the standard practice.

¹ Dipartimento di Meccanica, Sezione Materiali per Applicazioni Meccaniche, Politecnico di Milano,Milano, Italy

² Sustainable Materials Processing Research, School of Materials Sciences and Engineering University of New South Wales,Sydney, Australia

³ Tenova Metal Making, Via Monte Rosa, 93 – 20149 Milano (Italy) Tel.: +39 (02) 4384.7892

⁴ Tenova Goodfellow, Toronto, Canada