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Study Regarding the Evolution of Solid Waste Generation During Steelmaking

Dana–Adriana ILUŢIU–VARVARA, Elena Maria PICĂ, Liviu BRÂNDUŞAN

Technical University of Cluj - Napoca, Muncii Blv., No. 103-105, Cluj – Napoca, Cluj,
E-mail: dana.varvara@gmail.com

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SUMMARY

This paper describes problems regarding the evolution of solid wastes generated during steelmaking in the electric arc furnace. These solid wastes are slags and dusts.

Approximately 1–2% of the charge is converted into dust and 10 – 15% is converted into slag (Erdem *et al.*, 2005). Nearly 12 million tons of steel slag is produced annually in the Europe. In the table 1 is presented the evolution of crude steel production in worldwide. In Fig. 1 are shown minimum and maximum quantities of solid waste from steelmaking.

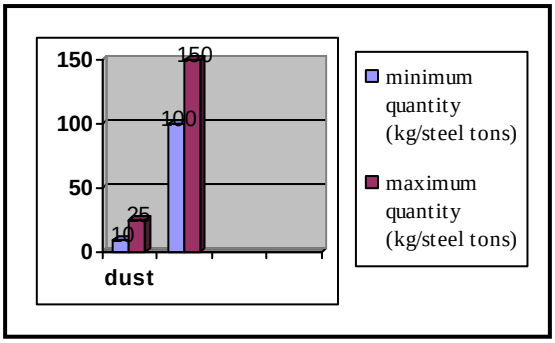

Fig.1. Solid waste from steelmaking

Tab.1

Evolution of World Crude Steel Production
(in million metric tons)

Steel production in	Year		
	2007	2008	2009
Romania	6.3	5.0	2.7
Europe	364.5	344.1	265.8
Worldwide	1345.8	1326.5	1219.7

The solid waste quantity and chemical composition varies according to the quality of the charge and the type of steel elaborated (Iluţiu – Varvara, 2007).

This dust is considered as a toxic waste due to its content of heavy metals. It is estimated that the world-wide total production of EAF dust could be as high as several million tones, all of which must be treated, recycled or land-filled (Sofilic *et al.*, 2004).

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REFERENCES

1. Erdem, M., H. Soner Altundoğan *et al.* (2005). Hexavalent chromium removal by ferrochromium slag. Journal of Hazardous Materials. Vol. 126. no. 1-3. p. 176-182.

2. Iluţiu – Varvara, D. A. (2007). Generarea şi transferul substanţelor poluante în procese industriale. Editura U.T.Press. Cluj-Napoca. ISBN 978-973-662-344-8.

3. Sofilic, T. *et al.* (2004). Characterization of steel mill electric-arc furnace dust. Journal Hazardous Materials. Vol. 109. p. 59-70.