



INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

"KEY ELEMENTS FOR A SUSTAINABLE WORLD: ENERGY, WATER AND CLIMATE CHANGE"

Minimization of Foundry Sand Generation Using Tools from the Cleaner Production Program

C. B. Maciel^a, C. A. M. Moraes^b, C. E. Teixeira^c, I. A. Schneider^d

a. Tecnoambi Consultoria e Engenharia Ambiental Ltda, Caxias do Sul, cristiane@tecnoambi.com.br

b. Universidade do Vale do Rio dos Sinos, São Leopoldo, cmoraes@unisinos.br

c. Universidade de Caxias do Sul, Caxias do Sul, ceteixeira@ucs.br

d. Universidade Federal do Rio Grande do Sul, Porto Alegre, ivoandre@ct.ufrgs.br

Abstract

The metal casting process generates several kinds of solid wastes, where the used foundry sand is the main one and most of it is generated during the check out of the solid metallic parts from the molds. The increase of the solid waste deposition costs, the creation of specific environmental legislation, and the low environmental performance of *end of pipe technologies* have brought efforts in the development of more effective solutions. The waste minimization means to change paradigms, because it constitutes a new concept of environmental management based on the principle of prevention of pollutant generation, and the reduction of the solid waste amounts being treated or disposed. Based on the cleaner production methodology tools, the present work evaluated the process of metal casting focusing in the minimization of the solid waste used sand generation from the Foundry Company Metalcorte Metalurgia Ltda, suggesting minimization opportunities for this waste. It was also considered some environmental, technical and economical aspects, which are important to choose the best opportunities to be implemented. The suggested opportunities have several levels of complexity. Some of them may be implemented immediately, while others require research development to become viable considering technical, economical and environmental aspects, depending on the type of opportunity, such as regeneration of used molding sand, reutilization processes, and the substitution of materials, which generate toxic gases. The implementation times are variable and an implementation chronogram can be elaborated, focusing those ones which can be implemented in a short and medium term. On the other hand, the long term alternatives need more profoundly studies. It must be emphasized that from the 19 opportunities studied in this research, 9 are low cost opportunities and can be easily implemented by the company in a short term. The foundry sand waste presents a good potentiality of minimization accordingly the extensive list of opportunities which were identified. At the same time, considering the complexity of metal casting processing and also the methodology developed by UNIDO-CNTL, the implementation of a cleaner production program in this kind of company needs investigation like the one presented here to stimulate the company managers for applying efforts to waste generation prevention, using effective and viable tools to search the sustainable development in this industrial sector.

Keywords: Metal casting, used sand, minimization, cleaner production.

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