

PROCESS TECHNOLOGY CONCERNING THE INTEGRATED SOLID INDUSTRIAL WASTE MANAGEMENT FOR THE PAPER INDUSTRY OPTIMIZED BY INFRARED APPROACH

by dr.eng. Elena Popa *, dr.eng. Ionel PISA*, dr.eng. Sorin IGNAT **, eng. Cristina CIOBANU*, dr.eng. Manuela GEORGESCU*

* *Politehnica University of Bucharest, Romania*

** *ENSAM Cluny, France*

This paper tries to present the work concerning technical possibilities to tamp the solid industrial waste coming out from an already refurbished paper plant in Adjud, Romania, in order to reduce the overall costs of the necessary landfill deposits and to create a real income by producing energy and by selling the separated metal part of it.

The principal contributions of this research is to create a thermal treatment for the primary solid waste, capable to be realized inside an industrial installation at a competitive cost, to produce energy at the same time of tamping the waste a high degree, to create the possibilities for an easy metal pieces separation and not to produce pollutant emissions.

An infrared system of a FLIR S65 videocamera (7-14 μm) and double wave length OMEGA OS3750 pyrometer (0.9 – 1.5 μm) have been used in order to achieve the best thermal regime to ignite and to control the burning process of the industrial refuse. Infrared process controlling tried to establish the optimum refuse mass flow rate towards the furnace., in order to respect the necessary variations of temperature of the igniting layer to maintain a stabile flame.

This work has been carried out by a scientific team from Politehnica University of Bucharest, ICPET-ECO SA Bucharest (all Romanian institutions) under a private financed research project by VRANCART SA Plant from Adjud, Romania (quoted at the Bucharest Stock Exchange, Romania).

The research project has been finished at the middle of July 2007. The obtained results are to be implemented at the VRANCART SA paper plant nearby Adjud (Vrancea district). Special acknowledgements have also to be presented to the Scientific Research Center for Defense N.B.C. and Ecology – Bucharest and PROSPECTIONS SA Bucharest, for homologations and official analysis concerning heavy metals in the resulted ash and dioxins and furan content of the flue gas.

Major conclusions of this work are the following:

- natural tamping mass ratio (between the primary waste and the final ash) has been obtained at an average value of 4.75;
- metal pieces are about 43% of the resulted ash;
- thermal regime has generated no dioxins and no furan in the flue gas;
- no heavy metal mass fraction has been detected in the ash;
- carbon monoxide emissions (by NDIR methods) have been lower than 260 mg/Nm^3 at 6% oxygen content in the flue gas;
- NO_x emissions (by chemiluminescence's) have been lower than 65 mg/Nm^3 at 6% oxygen content in the flue gas;
- the unburned material found in the ash did not exceed 4.3%;

- other technical data have been obtained during the project such are: the minimum residence period for the primary waste inside the furnace, the optimum oxygen concentration inside the furnace, etc.

Finally, a new special steam boiler has been designed in order to process a maximum primary waste flow rate of 250 t/month and it is to be in operation at middle of the next year.

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