UNPOLLUTANT MICROWAVE INCINERATION OF MEDICAL WASTE WITH HIGH RISK OF CONTAMINATION

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ABSTRACT

In Romania, the waste materials problem is becoming more and more acute due to the increase in their quantity and of the negative impact on the environment. An important waste category is represented by the medical solid waste materials that belong to the high contamination risk category. The source of these waste materials is hospitals and clinics - typical units from the point of view of the generated waste materials.

At present, the treatment of the medical waste materials, especially incineration, is done through classical methods that are hazardous for hospitals and also for the surrounding areas. The noxiousness of the present methods of incineration of the medical waste with high contamination risk is due to the emissions (CO, SO_2, NO_X, volatile organic compounds COV) produced during incineration.

When hospitals do not have their own incinerators, medical waste material with high risk of contamination can affect seriously the health of the personnel involved in the waste material collecting and transport activities.

Moreover, the transport of this medical waste material in or outside the hospital or clinics increases the risk of environment contamination due to the possible contamination of the transport means that become, in their turn, powerful sources of contamination of the roads.

All these elements determined the specialists of S.C. FITPOL S.R.L., a Romanian company, to actively involve into the management problem of the medical waste material with high risk of contamination and to develop an efficient method of incineration that is non-polluting for the environment and that can be used at the very place of waste material production. The constructive solution developed in the S.C. FITPOL S.R.L. Romania, (that has been presented in this paper), is founded on the utilization of microwave energy for both the waste incineration and for retaining the resulted emissions by using a special filter.

The microwave incinerator has been subject of a complex program of experiments that had as an objective to check the adopted constructive solution, the performances of the filter to retain the gas emissions resulting from the incineration of the medical waste and to check also the energy consumption.

The results of the experiments that will be presented in this paper, underline the fact that the microwave incinerator made in the S.C. FITPOL S.R.L. Romania:

- in operation, the incinerators does not pollute the environment with pollutant emissions (the measured levels are much under the levels permitted by the legislation in force);
- can be used for the incineration of the medical waste with high risk of contamination at the very place of their production (operating and post-operating blocks from hospitals, medical clinics for treatment of infectious diseases such as hepatitis or aids, private clinics, etc.);
- does not require a big investment in comparison with the existing conventional incinerators;
- has a low energy consumption in comparison with all other conventional systems of incineration;

- does not require special arrangements (water connection, gas connection) for its functioning.

KEY WORDS: microwave, medical waste, incineration, high contamination risk, emission, filter

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