



ERVO EnviTech s.r.o., Radniční ½, Pasáž U Lva, 434 01 Most, Czech Republic  
Tel.: +420 7770 023 936, e-mail: [ervoenvitech@seznam.cz](mailto:ervoenvitech@seznam.cz), <http://ekorecyklace.cz>

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## **ECOLOGICAL AND ECONOMIC USE OF DIFFICULT WASTE MATERIALS IN SMALL EASILY ASSAMBELABE GAS WORK UNIT USED FOR BREAK DOWN OF HARD TO PROCESS PLASTIC MATERIALS TYRES AND SEWAGE SLUDGE**

Unwanted product of rising living standards and wealth is increasing number of waste that is accumulating in landfills, seas and oceans where it has negative impact on natural ecosystems. It contaminates marine organisms and enters the food chain.

It is not efficient to burn high molecular waste and it can be also dangerous. The high molecular waste contains energy potential that is better to exploit by using modern pyrolysis technology developed by the ERVO.

ERVO PYROLISIS TECHNOLOGY is innovative technology developed by Czech engineering company ERVO EnviTech s.r.o.

This technology has been developed using petrochemical pyrolysis methods. It uses hermetically closed reactor without presence of oxygen where by increasing temperature high molecular structures are broken down while it produces solid substances and pyrolysis based gas. About 30% of the gas is used for running the system while remaining 70% can be used either for production of liquefied fraction such as oil, diesel, chemical raw material or for electric power production trough installation of micro turbine.

THIS CONTINUOUS CONTROLLED MULTICYCLICAL PYROLISIS HAS FOLLOWING KEY CHARACTERISTICS:

- **Mobility** due to easy to assemble design and construction.
- **High production capacity** of 4 to 7 t/24 hrs. Larger production capacity can be achieved by using a number of production units in any given location.
- **Continuous production technology** ensuring high production and economic efficiency.
- **Management control of production process** that can allow to determine proportion of gas, liquid or solid fractions according to production needs. However, normally the ERVO system is managed by automated programmed processor.
- **Multicycle processing** results in flawless depolymer break down of complex molecular structures that ensures high quality of final products and good profitability.

## **Technology of the ERVO module has many ecologic, safety and economic advantages if compared with other existing systems.**

- Module EVRO is relatively small with low demand on space and land (length 7.5m, width 5.1 m, height 4,2 m and weight 6.5 t)
- The enclosed system precludes emissions of smell.
- The key solid fraction products are ecologically faultless, harmless and commercially attractive.
- Noise disturbance is well within the health standards and there are no vibrations.

### **Ecologic advantages**

The gasification of waste materials takes place in enclosed environment isolated from the outside environment. Also, the cooling water is operating within enclosed cycle with no waste water produced. High temperature in double skinned boiler uses the pyrolysis gas and fuel oil. The temperature of burning exceeds 1 200 degrees C for 4 to 6 seconds and this precludes formation of toxic dioxins and other toxic substances.

### **Operation safety**

The ERVO technology is designed to ensure maximum safety that is reflected in internal pressure and temperature within the boiler (reactor) while the quality of materials used is not affected by aggressivity and toxicity of the processed substances. Internal system precludes generation of explosive substances.

Technological components of the standard ERVO system are certified metal double skinned containers for gas and liquid products are in compliance with safety regulations. From the safety requirements it is necessary that each ERVO module has developed it's operation procedures.

### **Technologic advantages**

The basic technologic advantage of the ERVO system is continuous multicyclic operation of the depolymerase process, automatic management control of system operation and choice to switch to manual operation and correction.

## **ERVO technology fulfils conditions for BAT-Best Available Technologies**

The ERVO EnviTech s.r.o. technology was patented in Czech Republic in on 30.10. 2017 by the Agency for Industrial Ownership (Urad pro prumyslove vlastnictví) under number CZ 31 153 UI as a used example.

### **Economic Advantages**

The economic efficiency is ensured by relatively low cost, use continuous production and safe technology. This is enhanced by income form waste

collection, efficiency of the system's technology and from expected sale of the final products.

**Technology ERVO is highly profitable with payback period estimated in the country of origin at 36 months.**