

Cavitation Options for Waste Autoclave Technology for Power Generation

A.S. Kudryavtsev

Currently, one of the most promising areas of recycling is the transfer traditional sterilization technologies for the processing of municipal solid waste.

The development of autoclave technologies in the recycling of household waste goes in directions of improving quality of fractionation and increasing efficiency.



- On dumps of our planet we already have millions tons of waste.
- One percent efficiency of waste treatment means billions MW additional energy capacity

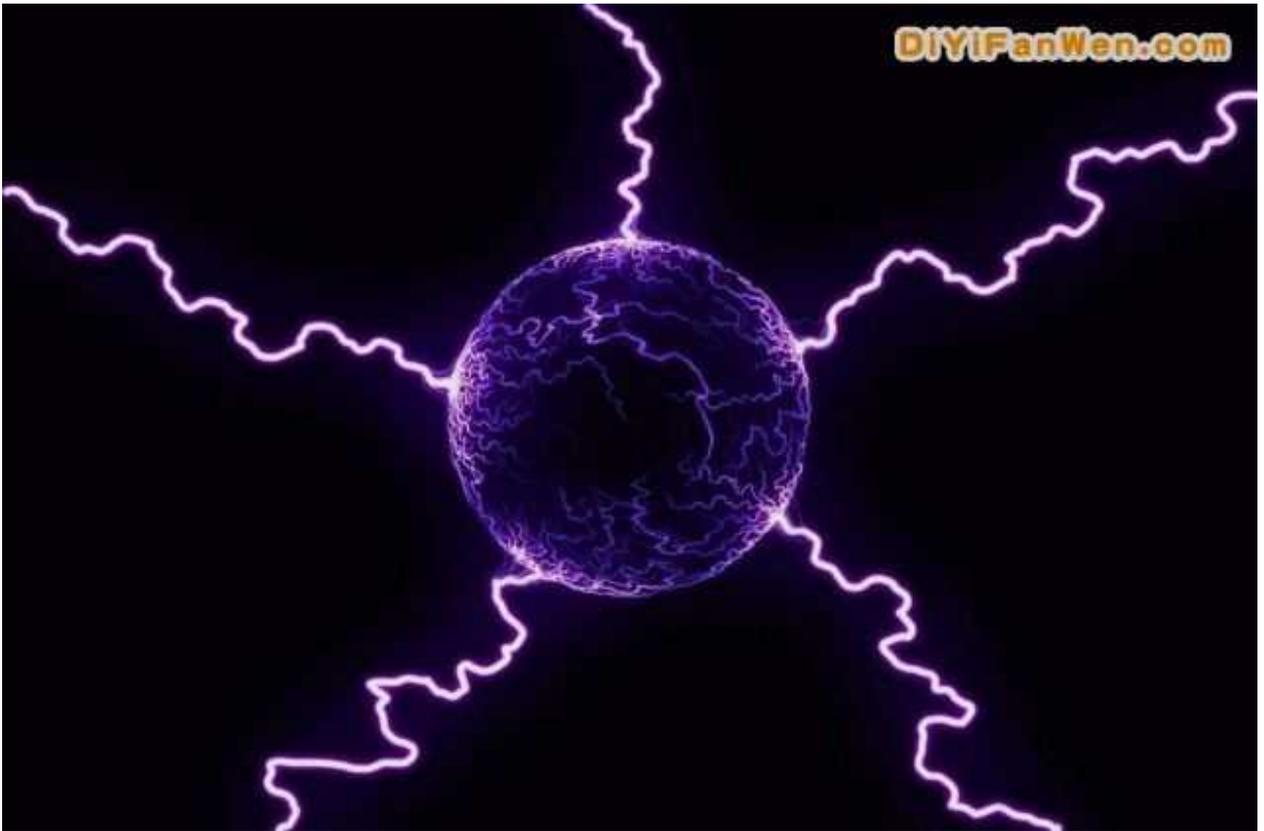
Autoclave technology is the mass in garbage handling autoclave at pressures of from 4 to 7 bar of superheated steam at a temperature of 120 to 200 C.

In the most basic applications as the primary treatment vessel is used the horizontal rotating autoclaves combined with some debris grinder. In the processing of plastic bottles pulverization occurs, packets, boxes, etc. and their partial softening and melting. Organic wastes decompose into cellulose, lignin and other fractions, wherein the cellulose content after autoclaving is 50%.

The main element of autoclave technology is horizontal rotating autoclave. Our project based on autoclaves GV-2,0 of Degtyarsk Plant (DMZ).



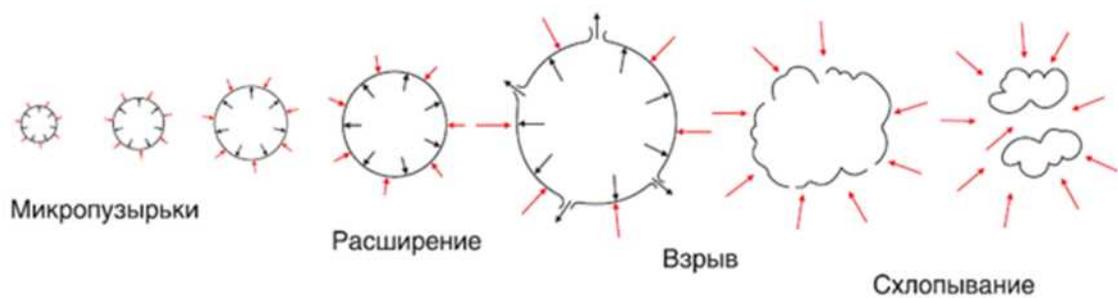
Here we have introduced an additional option of cavitation by acting on the mass of treated garbage inside autoclave electric field and ultrasound influence.



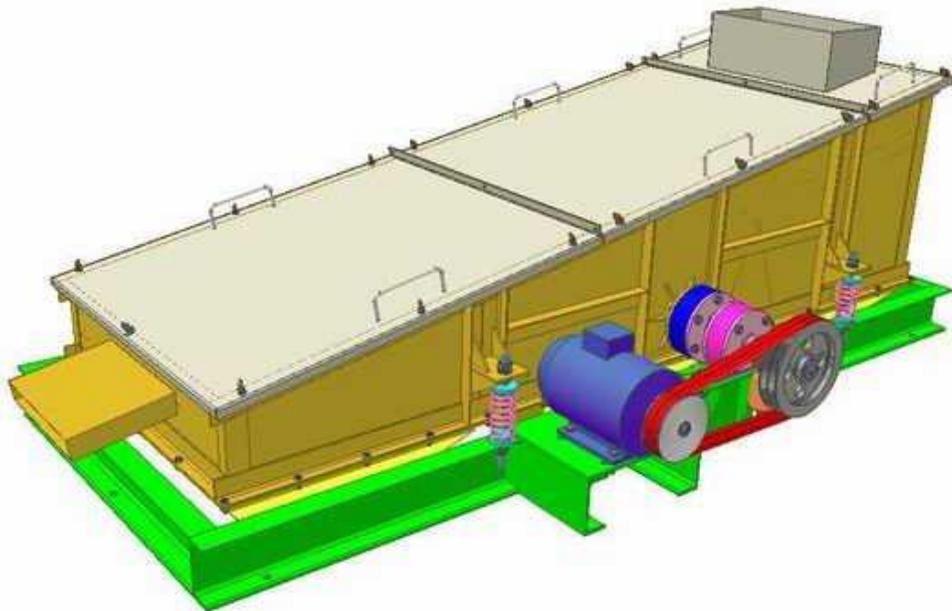
Then autoclave begin to rotate high frequency voltage inside autoclave begin to charge cellulose particles.

Steam and high frequency voltage together begin cavitation process.

These particles is a initiator of cavitation processes.



Cavitation creates micro bubbles. Then bubbles begin to collapse with high energy discharging and extremely high velocity. A lot of collapsing bubbles begin to destroy rubbish particles. As a result cellulose, plastic and metal particles became smaller and smaller.



Air jet takes the top part of the mass that consists from organic, out of the conveyor.

High quality of secondary cellulose produced by cavitation treatment provide more than 0,5 kWh electrical energy per 1 kg of MSW.