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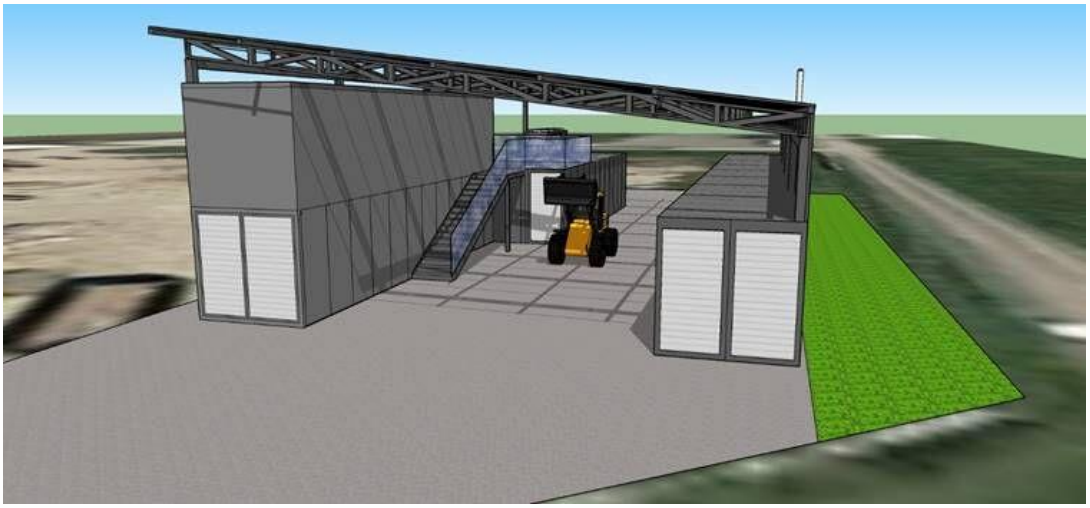
Velké Pavlovice | Plant for plastic

Our mobile pyrolysis system for plastic waste in Velké Pavlovice will be open this winter.



This pyrolisis system is focused on **maximum yield and highest quality of liquid fraction** during thermal decomposition of this material **at the expense of input power**.
Ideally, this option means that after thermal decomposition of sorted and crushed waste plastics, we can obtain up to **90% by weight of the process liquid of the highest quality, ie. up to 200 liters of process liquid**.
The obtained process gas and the solid residue are then contained in the remaining volume of the obtained products almost equally.

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As mentioned above, the performance of the device thus conceived is considerably reduced in view of the set process conditions, where the thermal decomposition of the plastics occurs at low process temperatures, thereby prolonging the residence time (exposure) of the material at this temperature. The input power of such technology is max. 200 kg/hr. in continuous operation.

For this variant, the technology is equipped with two low-temperature reactors and two additional low-temperature evaporation tanks. The whole system is heated by direct-heating resistors with active electronic thermostatic regulation.

The total installed power input of this version of the technology is 170 kW, the operating electricity consumption is at a maximum output of about **80 kW/hour**.

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Device Operation Description

Module 1

Received sorted residual plastic free or in the form of bales will be supplied directly to crush the required volumes for daily capacity and plant operation.

Molded plastic packages will be crushed during the morning shift to the format needed to continuously supply depolymerization technology.

Module 2

The plastic grit will then be transported by pneumatic system to a large capacity hopper from which it is automatically dosed in a volume of up to 200 kg / h. into the actual process of thermal depolymerization. Here the plastic material is thermally decomposed.

Module 3

There is a low-temperature thermal depolymerization of residual plastic. Thermal depolymerization is a perspective method of material and energy utilization of residual plastics. We are talking about an endothermic process that arises in anaerobic environments, ie. without access to the air or other oxidants.

This variant of the technological assembly exclusively uses process temperatures up to 400 ° C for the processing of residual plastics.

These temperatures exceed the limits of thermal stability of polymeric (hydrocarbon) chains of plastics, they break down (dry distillation) and produce low molecular weight products (small process gas C1 - C4 and majority of process liquid ≥ C5 - C18) and a small amount of solid residue (pure inorganic carbon).

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Module 4

The mixture of the obtained gas and the aerosol droplets of the process liquid is controlled by suction from the reactors into condensation. Here, a two-stage condensing assembly is installed for each of the two technology reactors.

In condensation process liquid droplets are efficiently precipitated, which flows into the cooled double shell primary tank with a safety trap and separates from the residual gaseous component. In the second half of module no. 4 there is a central control room and operator control room with basic equipment and main electrical switchboard technology. In the primary oil tank, the process liquid obtained is cooled to about 50 ° C.

Module 5

The cooled liquid is gradually pumped into large-volume double-shell tanks of 2 x 10,000 liters. There is also a fully automatic circulating filtration of the process liquid.

Module 6

The pure process fluid is automatically pumped into a 2,200-liter operating safety double-shell tank that serves as a fuel reservoir for diesel generator. The process fluid thus obtained and treated with its properties and consistency is very similar to conventional diesel fuel and can be used directly as a fuel, e.g. as a fuel for generators or engines as a substitute for diesel fuel, or as feedstock for the petrochemical industry, or as a source of highly valuable compounds for further processing.

Furthermore, the process produces a negligible amount of process gas, which is a mixture of gaseous hydrocarbons and is similar in its character to natural gas. This residual gas in a volume of about 3 m3 / hr. is free of harmful emissions in a low-temperature safety burner.

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The last obtained product by thermal depolymerization is pure carbon in inorganic form and is continuously discharged through a screw double-walled DN300 cooling system with a safety flap and a 70 mm screw press with an external outlet into the reservoir in module no. 3. Its volume is about 5 percent by weight of the input volume of residual plastics being processed.

In practice, this means a yield of up to 10 kg of pure carbon per hour, which will be collected and taken away as needed for further use as a trade item. This form of carbon is used as a pigment in dyes, a filler in the manufacture of tires, building materials, or plastics, respectively as a sorbent, or after further treatment as an NPK carrier and hydro-sorption material for soil application in agriculture.

The weight volumes of the obtained thermal depolymerization products of residual plastics at a process temperature of up to 400 ° C, as mentioned above, are in the range:

- process gas (3 wt.%)
- process oil (85 to 93 wt.%)
- process inert carbon (3 to 5 wt.%)

The ratios of the obtained process gas and oil can be controlled to a limited extent by adjusting the appropriate process parameters to suit the operator's purpose and needs.

The volume of residual carbon cannot be influenced and depends only on the composition of the input mixture of the processed plastic.

Thermal depolymerization technology is produced in accordance with European Parliament and Council Directive No. 46/2006 EC, and in accordance with other related legal and technical standards.

The technology is designed, developed and constructed as waste-free technology, ie. that all the thermal depolymerization obtained products can be used safely and sensibly and as a technology without the need to be permanently connected to an external power source for their operation.

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