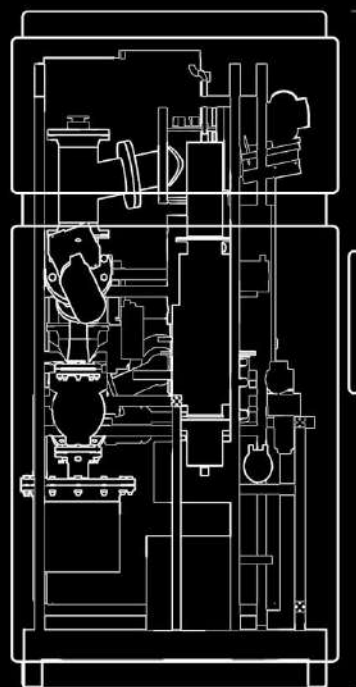
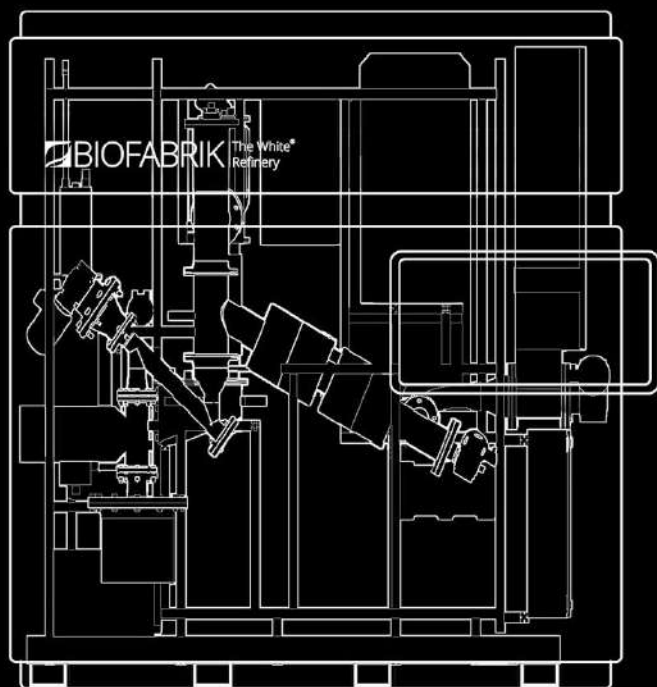


# WASTX PLASTIC

## PLANT DESCRIPTION



# SUMMARY

The tasks in plastics recycling are as diverse as the type of different raw materials. With WASTX Plastic, Biofabrik offers for the first time a container-based, decentralized plant for processing plastic waste or production residues that cannot be directly recycled into oils and waxes that can be used for materials or energy.

The advantages of the process over conventional disposal are reduced logistics costs and high local added value.

The compact and highly automated WASTX Plastic plant robustly and cost-effectively converts up to 1,000 kg of plastic waste (polyolefin fraction) per day into usable raw material or fuel.

The introduced substrate is pyrolyzed, then the oil vapors are condensed and solid residues (coke) are discharged. The pyrolysis gases can optionally be used for largely self-generating the plant's power consumption or are incinerated without causing any damage.

The product condensate can be used, for example, as a raw material in the chemical industry.

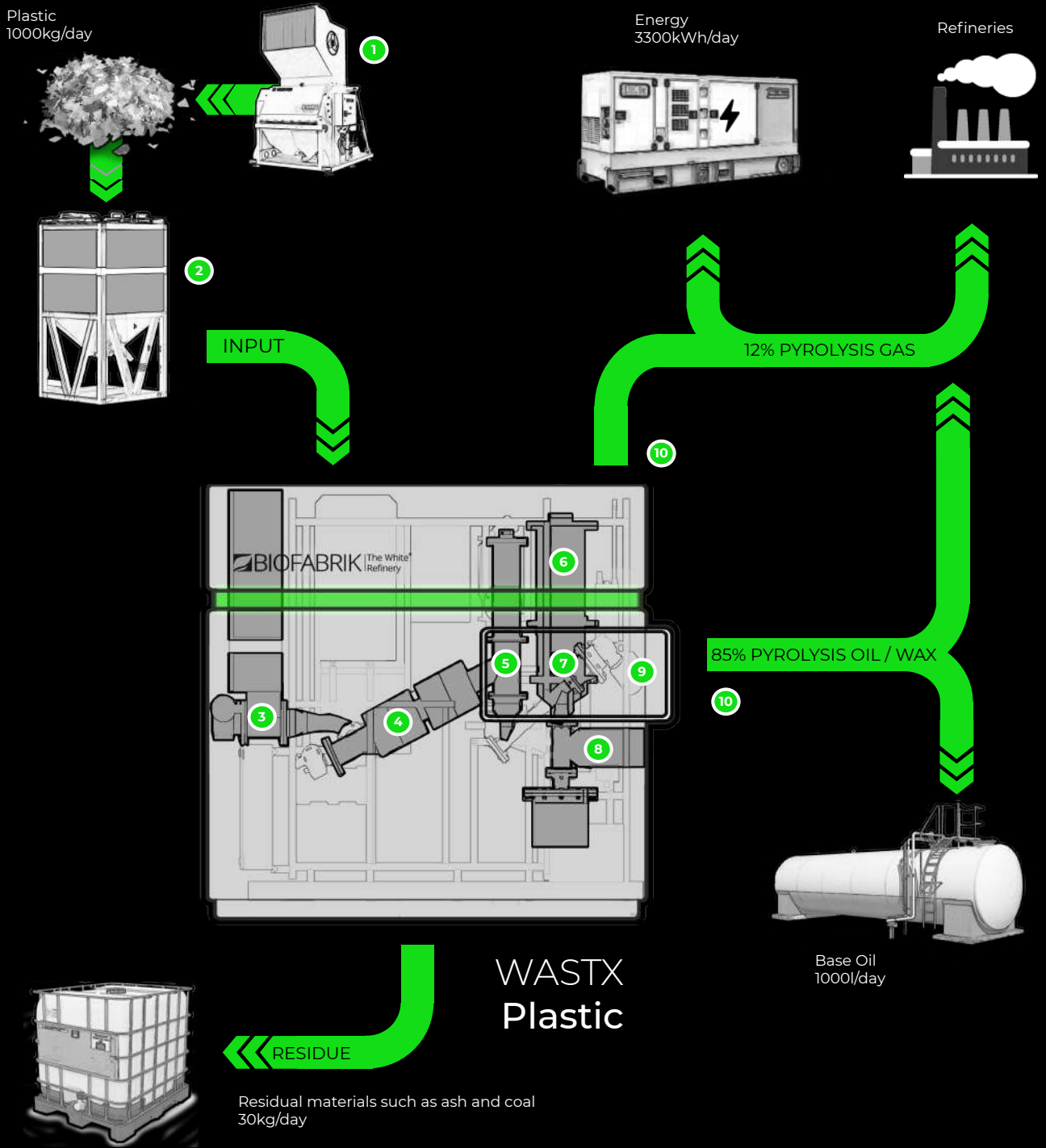
The plants are consistently installed in containers and are planned both for the extension of already existing recycling plants. The system is designed for polyolefin waste as the dominant material stream.



# PROCESS STEPS

## WASTX Plastic

ⓘ detailed explanations on the following page. Mass balance depending on input quality (degree of contamination)



# PROCESS STEPS

## WASTX Plastic

🔗 detailed explanations to the previous page

- 1 Cutting mill (optional)**  
If the feedstock is too coarse, it can be reduced to a suitable particle size in a cutting mill.
- 2 Buffer (optional)**  
The small-sized substrate is buffered in a silo, e.g. for a daily requirement. From there, a blower conveys the material to the buffer above the feed hopper.
- 3 Substrate feed**  
By means of a tamping screw, the material is fed into the pyrolysis reactor as required and in an airtight manner, and melted in the process.
- 4 Pyrolysis reactor**  
In the reactor, the material is heated under constant agitation. At temperatures of up to 500°C, depolymerization occurs, i.e. cracking of the long hydrocarbon chains of the solid plastics into shorter chains of the liquid and gaseous products. In this process, excess carbon atoms are split off and form the solid residue as soot together with, for example, mineral contaminants.
- 5 Separator and residue discharge**  
In the separator, the residual materials fall to the bottom, while the oil and gas vapors rise to the top and are directed to condensation. The residuals are conveyed via a cooling section into the residuals tank, which can be locked gas-tight.
- 6 Staged condensation**  
In several temperature stages, the condensable components of the pyrolysis vapors are recovered as oil- or wax-like products.
- 7 Cooling system**  
By means of an active cooling system (compression chiller), low cooling water inlet temperatures can be reliably provided even at higher ambient temperatures in order to be able to separate low-boiling components.
- 8 Filter and discharge**  
By means of pumps, the condensate mixture is passed through filters and then discharged from the system. The products can optionally be converted into electricity on site or fed to an external material or energy utilization.
- 9 Control system**  
The entire system is controlled highly automatically. Via appropriate interfaces, the system can be monitored by the operator on site but also by remote access and controlled if necessary.
- 10 Output and possible applications**  
The output of the machine contains 85% base oil, 12% pyrolysis gas and small amounts of residues. The oil can be sold to the petrochemical industry as the main component of the output or converted into energy by a special generator. The gas is used to power the plant or to be sold bottled.

# DETAILED STRUCTURE

## WASTX Plastic

Ⓢ if not listed otherwise; design in steel, partly surface-treated

### DAILY BUFFER AND TRANSPORT SYSTEM

- Ⓢ Optionally upstream: Feedstock container as day silo, with feeder and discharge screw conveyor  
L/W/H approx. 6,000 mm / 2,350 mm / 2,700 mm
- Ⓢ Transfer screw conveyor
- Ⓢ Stainless steel intermediate hopper with inspection window: L/W/H approx. 265 mm / 250 mm / 500 mm,
- Ⓢ Feed hopper with gear motor plug screw: L/W/H approx. 265 mm / 260 mm / 283 mm. Heating cone and transition tube: length 567 mm

### PYROLYSIS REACTOR

- Ⓢ Tubular reactors with stirring element:
- Ⓢ Diameter 230 mm, length 2.000 mm several heating zones
- Ⓢ High temperature insulation

### SEPARATOR AND RESIDUE DISCHARGE

- Ⓢ Gravity separator with stirrer motor to prevent caking, two-piece: Diameter 220 mm, length 750 mm
- Ⓢ Rising screw: Diameter 120 mm, length 1,400 mm Barrier element
- Ⓢ Residual material tank: L/W/H approx. 600 mm / 400 mm / 600 mm

### STAGED CONDENSATION

- Ⓢ Two temperature stages as shell-and-tube heat exchangers: each diameter 600 mm, length 1.200 mm, plus head and sump sections
- Ⓢ Circulation system with pump and thermostat control
- Ⓢ Slot filter for prefiltration in circulation

### COOLING SYSTEM

- Ⓢ Compression chiller
- Ⓢ Recirculating chiller

### FILTER AND DISCHARGE

- Ⓢ Cartridge filter: 5 ym
- Ⓢ Control valve

### EMERGENCY FLARE

- Ⓢ Nozzle mixing burner with flame arrester and injector.
- Ⓢ combustion chamber: L/W/H approx. 600 mm / 400 mm / 600 mm
- Ⓢ Combustion heat output up to 150 kW

### CONTROL: CONTROL CABINET AND WIRING

- Ⓢ Control unit with software code based on Siemens SPS
- Ⓢ Sensor and actuator modules
- Ⓢ Power electronics
- Ⓢ Heaters equipped with load management
- Ⓢ Touch panel
- Ⓢ Emergency stop control
- Ⓢ Wiring
- Ⓢ Total connected load approx. 100 kWel @ 400 VDC, average demand: approx. 40 kWel

### RACK AND CONTAINER

- Ⓢ Welding frame with collecting tray: L/W/H approx. 1,400 mm / 1,400 mm / 1,800 mm
- Ⓢ 20' High Cube Open Side Container: L/W/H 6,058 mm / 2,438 mm / 2,896 mm Can be opened on three sides
- Ⓢ Light and power supply, exhaust system, gas sensor system

## 🕒 List of materials to be processed in WASTX Plastic

Short form	Name
LDPE	Low Density Polyethylene
HDPE	High Density Polyethylene
LLDPE	Linear Low Density Polyethylene
PP	Polypropylene
PP*C	Polypropylene with C-adhesion
PE	Polyethylene-Foil

## CONTÁCTANOS

Para más información o cualquier pregunta,  
no dude en contactar con nosotros

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