

ENRESS TDU2000® Pyrolytic Unit

The TDU2000® pyrolytic unit offers sustainable and economically reasonable plastic recycling technology to solve one of the modern world's critical problems.

Thermochemical plastic recycling with the TDU2000®

Ground plastic waste (up to 35 mm size fraction) goes into a large 9m³ (96,8 cu ft) input bin. From there, a screw conveyor takes the plastics to the main circuit of the machine. Here, at 380–460°C (710–860°F), a chemical reaction takes place to extract liquid and gas compounds.

The screw conveyor then moves the solid particles remaining in the primary circuit to a solid residue bin. This residue consists of carbon particles and harmless mechanical impurities.

The first reaction takes place in an anaerobic environment.

During the second stage, liquid and gas compounds are separated. Gases are then repeatedly cleaned with sorbents in four washing machines to remove any harmful particles, such as chlorine or sulfur. Treated gas is pressed into gas cylinders and stored.

Liquid output is treated during the second stage. This specific combination of temperature and pressure yields the desired types of liquid hydrocarbons similar to gasoline and petroleum. The resulting product – pure oil – may replace petroleum in new plastics.

Liquid residue from the second reaction (heavy oil) is pumped back to the primary circuit to go through the thermochemical reaction again. The whole process is automatic through all the stages.

- Pure oil may be reused to make new plastics.
- Gas (simple hydrocarbon mix) may be used as fuel.
- Inert solid carbon residue is similar to activated carbon, used in agriculture.

TDU2000® key information

- Emission-free technology.
- Fully automatic manufacturing process.
- Anaerobic (oxygen-free) environment through all stages.
- Noise up to 60 dB.
- A TDU2000® unit fits into six 40-ft shipping containers, with two containers placed one above another (see pictures), making the machine mobile.
- The unit recycles all kinds of plastic waste, including mixed plastic, except PET (up to 8%) and PVC (up to 3%).
- Input plastic waste must be crushed first (up to 35 mm³).
- Technology developed in the Czech Republic, made in Slovakia, with CE certification.

TDU2000® technical data:

Input:

TDU2000® processes up to 17 tons of plastic waste a day, 5,800 tons a year.

Output:

- 90% oils – 15.3 tons
- At least 5% heating gas – 0.85 tons
- At least 5% carbon residue – 0.85 tons

- The data stated above is approximate. The ratio may vary slightly, depending on the input and processing temperature.

Operation:

Electric input power: 600 kW.

24/7 operations with short technical downtimes once a month.

Safety:

- The machine is equipped with deviation sensors, as well as safety protocols and shutdown sequences.
- An error message delivered by the sensor results in shutdown sequence activation (oil and gas derivation shuts down).
- Anaerobic (oxygen-free) environment through all the stages, with safety valves that cut off air supply.

(IMAGE)

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TDU2000® DIAGRAM:

1. Input bin and screw conveyor
2. Dosing conveyor to the primary circuit
3. TDU2000® primary circuit
4. Carbon discharger
5. Primary oil and gas separator
6. TDU2000® secondary circuit
7. Oil management with pumping station
8. Gas treatment machine
9. Gas compressor