EPROTECH

enviromental protection technology

TECHNOLOGIES FOR END-OF-LIFE TYRE AND PLASTICS RECOVERY

# Pyro-gasification

# with microwaves

Material recovery and energy recovery with solutions sized to meet your process requirements.

**PATENTED SOLUTION**



**We convert end-of-life tyres into solid, liquid and gaseous fractions for subsequent recovery and value-added use.**

## Tailored configuration

Feedstock, capacity and objectives guide plant sizing.

TECHNOLOGY AND PROCESS

# Microwaves at the heart of treatment

The technology is based on pyrolysis: the thermal decomposition of material in an oxygen-free environment. In microwave thermolysis, the material absorbs electromagnetic energy and converts it into heat, promoting the decomposition of its constituent components.

Where required, microwaves can be combined with electric resistance heating. The contribution of each technology is defined according to the material and the intended outcome.

**01**

### Preparation and feeding

The material is prepared and fed into the system according to the selected configuration. The feeding method depends on the characteristics of the end-of-life tyres and the required capacity.

**02**

### Treatment in an inert atmosphere

Microwaves and, where applicable, electric heating provide the energy needed for pyrolysis, without burning the tyres in the process chamber.

**03**

### Recovery of the fractions

Liquids and gases are routed to dedicated sections. The solid fraction is cooled and sent for separation and recovery, including recovery of the metal component.

APPLICATIONS

## END-OF-LIFE TYRES

One application of the technology is the treatment of end-of-life tyres. The form of the feedstock, its preparation and the feeding system are defined together according to production objectives.

## PLASTICS

The technology is also compatible with plastics treatment; a dedicated project for this application is currently underway.



RECOVERY AND VALUE-ADDED USE

# From end-of-life tyres to new resources

The reference process enables the recovery of solid, liquid and gaseous fractions. Proportions and characteristics are indicative and are verified for the required feedstock and configuration.

| Recovered fraction | Indicative share | Potential uses |
|---|---|---|
| **Recovered carbon black** | **Approx. 40%** | High-quality dry rCB, with properties reported to be up to 95% similar to those of virgin carbon black. Potential uses include tyres, technical rubber compounds, pigments and toner. |
| **Spring steel** | **Approx. 5%** | The metal fraction can be separated and sent to steelworks for reuse. |
| **Fuel oil** | **Approx. 40%** | Sulphur content below 1%. Potential use as marine fuel, subject to verification of the required specifications, or as feedstock for further refining. |
| **Gas and hydrogen** | **Approx. 15%** | A mixture of LPG-type gases and hydrogen, suitable for combined heat and power generation. Indicatively covers 70% of the plant's electricity demand. |

*Indicative values for end-of-life tyre treatment, to be confirmed for the selected feedstock and configuration. The qualitative comparison of rCB relates to the properties considered and does not imply equivalence in every application. Energy coverage depends on the process balance and the combined heat and power system.*



**Recovered carbon black**



**Spring steel**



**Oil / liquid fraction**

TAILORED CONFIGURATION

# A plant built around your process

Plant sizing starts with the material to be treated and the customer's objectives. We define production capacity, feeding and handling, treatment and cooling sections, automation level, gas management and recovery of the resulting fractions.

Different feeding methods, including continuous feeding, can be assessed according to feedstock preparation and process requirements. The aim is to develop a configuration aligned with investment, operation, maintenance and integration with existing lines.

### TAILORED PROCESS

Configuration based on the feedstock, required capacity and recovery objectives.

### MULTI-FRACTION RECOVERY

Carbon black, steel and liquid/gaseous fractions for subsequent recovery and value-added use.

### PLANT INTEGRATION

Assessment of process sections and opportunities for integration with existing lines.

### OPERATIONAL FLEXIBILITY

Different feeding methods, including continuous feeding, to be assessed according to the process.

## LET'S ASSESS YOUR APPLICATION

Tell us about the tyres to be treated, the expected throughput and your recovery objectives. We will assess the technology and configuration best suited to your process.

**REQUEST A PROCESS ASSESSMENT**

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