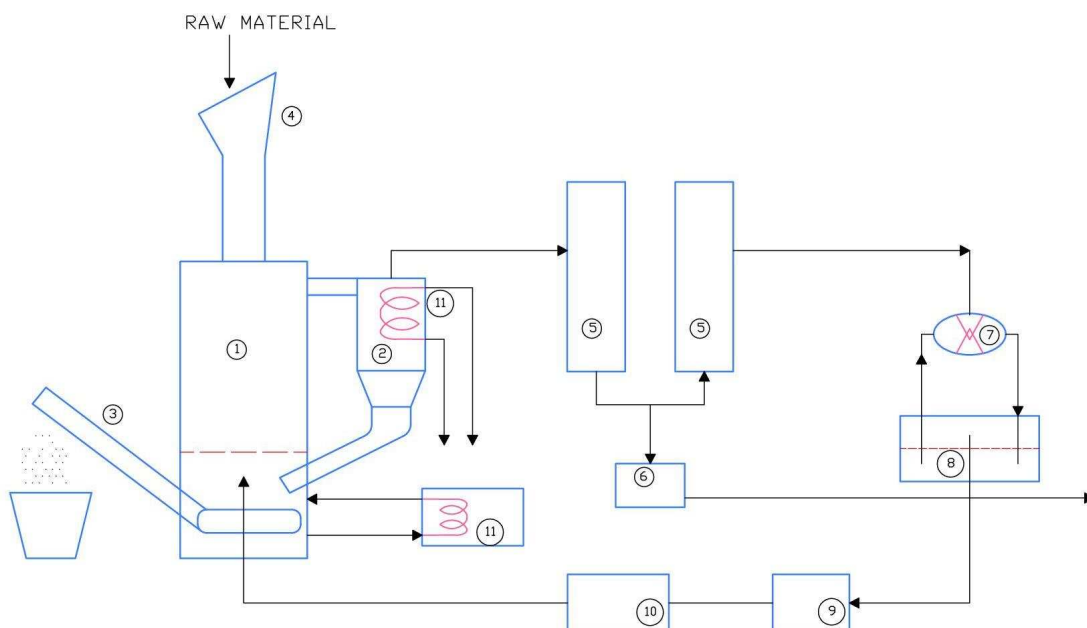


## TYRE PYROLYSIS

Installation for rubber waste pyrolysis designed for processing of used tyres and plastic waste (polyethylene, polypropylene, polystyrene), where the final product could be electricity, thermal energy, steam or liquid fuels. The installation will be designed and built in accordance with environment protection regulations and other legal requirements in force.

A simplified diagram of the proposed installation with the processing capability of about 20 tonnes per 24 hours, and generating some 1 MW of electricity or heat is shown below.

### DIAGRAM OF RUBBER WASTE PROCESSING



The raw material – pieces of rubber waste and plastic – is fed through a sealed input unit **(4)** to the pyrolysis retort **(1)**, where it is decomposed at the temperature around 520°C with a restricted oxygen access. Vapours generated in this process are carried via a cyclone separator **(2)** to the stripping column **(5)**, where they are separated into carbohydrate fractions (from petrol fraction through oil fraction to heavy oil fraction).

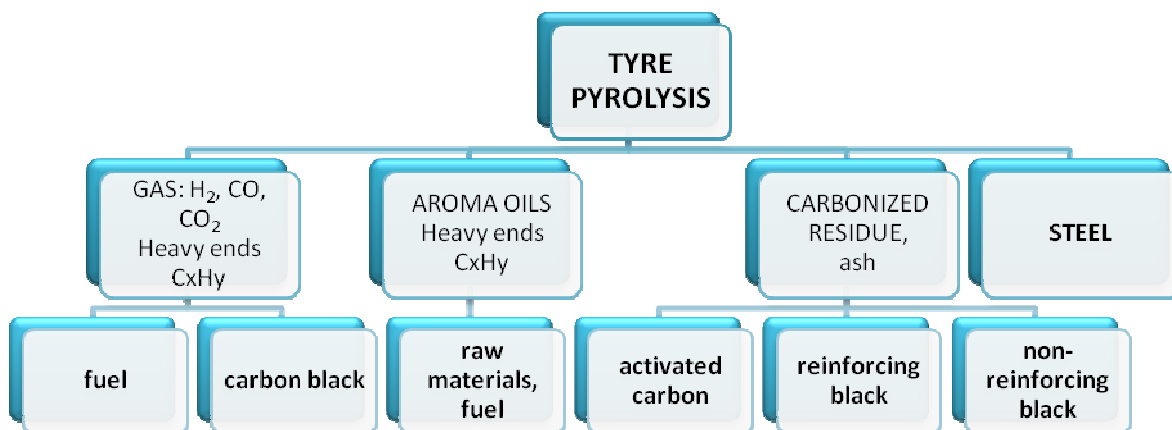
Liquid fractions, condensed in heat exchangers **(6)**, are collected in the final product tanks **(7)**, where they are simultaneously separated from pyrolytic gases. The gaseous fraction (pyrolytic gas) generated during the operation is compressed in the compressor **(11)** and fed to the tank **(12)** to supply the retort.

Solid pyrolysis waste (carbon, steel cord) produced in the retort **(1)** and cyclone separator **(2)** are removed from the water seal by a conveyor belt **(3)**, ensuring the air-tightness of the whole installation .

The vacuum system, consisting of the separator **(8)**, vacuum pump **(9)** and dephlegmator **(10)**, apart from the gas separation function, creates a slightly negative pressure in the whole installation, thus preventing the pollutants from escaping to the atmosphere.

The temperature regime, necessary to the correct operation of the installation, is maintained by the automation system and heat exchangers **(13)**, whose energy can also be used in other technological processes.

## TYRE PYROLYSIS PRODUCTS



Liquid and gaseous pyrolysis fractions can be used:

- for electricity generation – in generators powered by Diesel and gas-fuelled engines;
- for heat generation – burning in steam boilers;
- for superheated steam production;
- for the production of the full range of liquid fuels.

The equipment for tyre pyrolysis together with the raw material and intermediate product store can be accommodated in a light building (*height – 12m; area – ca. 2000m<sup>2</sup>*).

Estimated quantities of products obtained from pyrolysis of 5 tonnes of R14-R18 type tyres:

- a) 2 tonnes oil fractions
- b) 1,5 – 2 tonnes coke
- c) 0,5 m<sup>3</sup> gases
- d) 0,5 – 1 tonne scrap metal

Differences in the composition of passenger and lorry tyres.

	<b>Opony Samochody osobowe</b>	<b>Opony Samochody ciężarowe</b>
<b>Rubber</b>	47 %	45 %
<b>Carbon black</b>	21,5 %	22 %
<b>Steel</b>	16,5 %	25 %
<b>Textile cord</b>	5,5 %	
<b>Zinc oxygen</b>	1 %	2 %
<b>Sulphur</b>	1 %	1 %
<b>Other chemicals</b>	7,5 %	5 %

