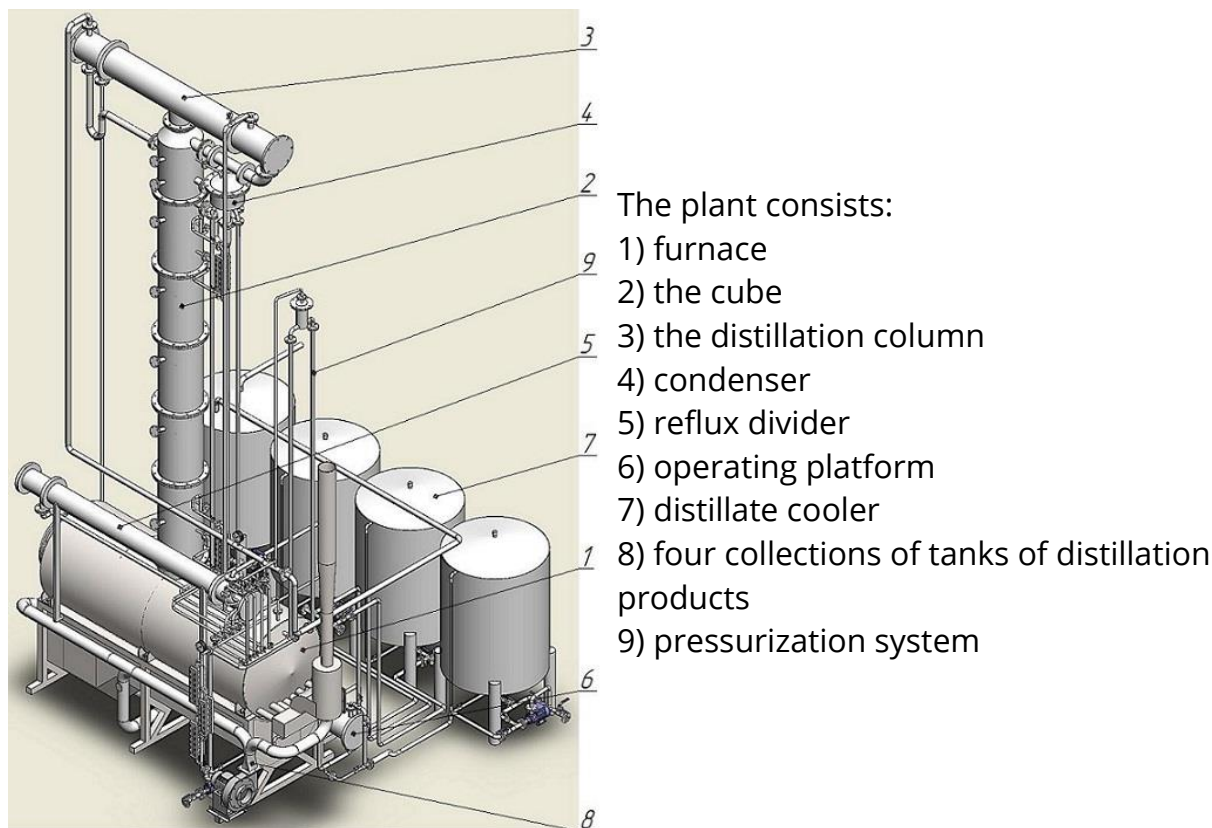


## Flow sheet of the plant SARGAS

### Technical parameters

|                                      |             |
|--------------------------------------|-------------|
| The productivity of the column t\day | 4           |
| Pressure, MPa                        | 0,05        |
| Working temperature, C               | 380         |
| Dimensions (Width/Lenght/Height), m  | 4,5x4,5x7,2 |
| Installed electric capacity, kW      | 2,6         |
| Nominal voltage, V                   | 380         |
| Nominal frequency of the current, Hz | 50          |

## Flow sheet of the plant SARGAS



The plant consists of a furnace (1), the cube (boiling tank, 2), the distillation column (3), condenser (4), reflux divider (5), operating platform (6), distillate cooler (7), four collections of tanks of distillation products (8), pressurization system (9).

The oven light design, the heat capacity of about 100 kWt, consists of a fluidized bed zone and the precipitation zone. The main type of fuel — the carbon fines produced during the pyrolysis of waste rubber products. Side of the furnace in the area of the fluidized bed is the door through which the operator throws the fuel (about once every 5 min) and produces a slag skip to the grate (approximately every 2 hours). At the end of the furnace in the deposition zone is the door to clean the lining of the settled ash (once every 12 hours).

In the embrasure of the upper blower can be installed gas or oil burner.

Cube (2) is a horizontal cylindrical vessel with a capacity of about 3.2 m<sup>3</sup>, mounted directly on the oven. Inside the cube there are gas pipes. Hot gases from the end of



the precipitation zone of the furnace get to the gas pipe, make two turns, giving the heat content of the cube, and the smoke exhauster emitted into the atmosphere. At the top of the cube has a neck with a flange, which is set fractionators. The cube is equipped with a level indicator for monitoring and measuring the volume filling bottoms. On the lower level of the supply tube has valves for sampling and draining the contents of the index level. On the upper level of the feed tube mounted pressure gauge indicating the pressure in the cube. Below the minimum level of liquid in a glass cube is set to a temperature sensor. Typically, the cube is pumped 1.25 m<sup>3</sup> of raw materials. The cube is equipped with a pump and a system of valves that allows to download material from the pipeline as a raw material, and from the collections of products.

Distillation column (3) consists of several side-bars (sections) within each section of the retaining plate mounted step plates 250 mm, 400 mm diameter columns. Section insulated with mineral wool. In operation, the column of liquid overflow pocket overlying plate fills the active area of the plates to a level of limited height of the drain wall, through which the liquid is poured into the pocket of the overflow plate and enters the underlying plate.

The condenser (4) located at the top of the column and is a horizontal shell and tube heat exchanger with two distribution chambers at the ends, communicating with the tube space. In the space between the tubes moves the cooling water. Couples from the top of the column via forwarded to the distribution chamber, then to the tube space, where the condensed and overcooled. The condensate flows in the opposite distribution chamber, from which is derived via a hydraulic gate and goes to the top of the column as a cold irrigation.

Overcooled well below the condensation temperature of the irrigation of the capacitor reaches the condensing plate, where its temperature is equalized with the temperature of upstream steam. The hot condensate from the condensing section is sent to the reflux divider (divider irrigation).

Reflux divider (5) is a concentric double fracture of the space between the modulations is divided into sectors, each of which gets a certain flow rate.

The condensate from the condensing section is fed to the first (outer) overflowing, will expire through the slots in the sector, from which is derived either by pipeline distillate (if appropriate valves are open), or flows over the second (inner) in the overflow pipe irrigation (reflux), followed by a water seal served on the first working plate of the column.

For heavy fractions of distillate diesel fuel temperature can exceed 300C, so the distillate of the four sectors of the divider pipeline goes into the refrigerator distillate (7).

On pipelines, communicating with a refrigerator, a group of cranes installed, perform some functions. The upper valves, communicating with the line of atmospheric pressure, to release or allow to let the air out of the fridge that need filling, especially when emptying. Lower valves, connecting pipes before and after the refrigerator, allow to drain the contents of the fridge at the end of the cycle, so as not to be confused with the next cycle gasoline diesel fraction of the previous cycle, remaining in the tanks refrigerator. Further, the condensate is sent to the overflow device consisting of a vertical standpipe and lift tubes and connecting them to the top of the overflow chamber communicating with the line of atmospheric pressure. After the overflow device of the distillate switching valves is sent to the appropriate collection.

Residual oil, whose temperature can reach 380S, appears in the collection of bottoms through the cooler balance. Air discharge the balance should be such as to ensure that the temperature specified after the refrigerator has glass on the pipe to install a temperature sensor. Typically, the temperature should be around 60 ... 80S. Pumping bottoms pump is mounted on the collection of bottoms.

Collections of products are the four vertical cylindrical vessel with conical bottom capacity of about 1 m<sup>3</sup> each. Usually, when distillation of oil-mixtures in the collections of direct residual oil (fuel oil), medium and heavy distillate (diesel fraction), a light distillate (gasoline fraction), bad cuts (different flushing, transient, etc., to be re-distillation). Collections are equipped with level indicators. Each collection has a pump for pumping the contents into the outer pipe. Collection of bottom product is equipped with a pump and a system of valves, allowing both to pump the product from the collection of external piping and pump in the collection of the remainder of the cube. Usually collections deflate after each cycle.