



# ODESSA NATIONAL ACADEMY OF FOOD TECHNOLOGIES

## BLOCK GRAIN DRYER

### The purpose and scope of application

The flue gases enter the gas pipeline 1 from the evaporators of thermosyphons (TS). TS condensation sections are located in the ball heater of grain 2. In the air heater with the TS 4, the air is heated to the temperature of the drying agent and fed to the drying shaft 3. In the block dryer, 42% of the heat carrier is not released into the environment, but recycled. It reduces energy losses with the spent heat carrier. The energy is fed through the TS. This ensures ecological safety of drying, uniform energy supply to the grain and its efficient mixing. The efficiency of the block grain dryer increased up to 20 - 22% in comparison to the basic scheme.

### Important parameters that characterize the level of scientific results

#### Technical characteristics of the block grain dryer:

- Productivity during wheat drying (from 20 to 14%) - 6 tons / h;
- expenses: fuel - 5,24kg / ton; energy - 3,5 ... 3,7 MJ / kg of moisture;
- thermal efficiency, 60%;
- Heat carrier - heated clean air.

**The design of the ball heater of grain:** • Number of TS - 130, number of TS lines - 20;

- Dimensions of the shaft / gas pipeline, m: height 1,2 / 1,2, width 0,7 / 0,7, depth 0,7 / 0,5.

**The design of the heater with the thermosyphons:**

- Number of TS- 208, number of TS lines - 8;
- Dimensions, m: height 2, width - 1.4, depth - 0.4.

### Intellectual Property Protection Status

Two patents were obtained.

### Market demand

The production of wheat in Ukraine arrives at to 26,5 million ton, that is why grain dryers are claimed for the enterprises of Agroindustrial Complex.

### Status of development

The operating pre-production model of setting is made.

