

## RESEARCH OF TRANSPORT PROCESS IN ATMOSPHERIC DRYING INSTALLATION

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The question of energy - and resources saving gained special urgency in Ukraine due to the depletion of domestic reserves of fossil fuels and the dependence on energy imports. When creating environmentally friendly energy saving technologies of various industries, intensification processes of heat and mass transfer play an important role.

Today, a great number of dryers are in operation in agriculture of Ukraine, the most common of which (95% of total dryers) is convective drying installations. The thermal efficiency of most plants is low (12-60%), as promising areas of research is the physical depth analysis of the processes of drying methods and their organizations to determine ways to improve the thermal efficiency of dryers.

One of the possible ways to reduce energy consumption during the previous drying wet material is the use of atmospheric dryer in which heat input is due to natural convection. As atmospheric dryer can be used the greenhouse with one-slope roof (Figure 1).

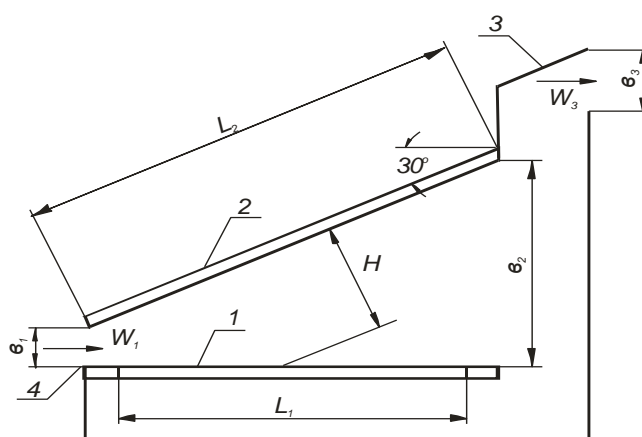


Figure 1. Scheme of atmospheric drying:

- 1 – dried material; 2 - a glass fence;
- 3 - air outlet; 4 - input of air to the dryer.

The dried material (1) length  $L_1$ , is on shelves. Above the material at an angle 30 degrees to the horizon is a glass enclosure (2) length  $L_2$ . The air enters to the drying channel through the inlet section (4),  $b_1$  height with speed  $w$ , m/s. Exhaust air at a speed  $w_2$  goes through the channel height  $b_2$ , and leaves from drying installations with speed  $W$  through section 3.

The following parameters were adopted for calculation

$$L_1 = 3,0 \text{ m}, L_2 = 4,6 \text{ m}, b_1 = 0,5 \text{ m}, b_2 = 2,8 \text{ m}.$$

The method of determining heat flow of solar radiation in atmospheric drying setting is given.

The heat radiation's characteristics for atmospheric drying type are calculated, that will continue to make a detailed heat balance of such drying installation and identify key indicators of the effectiveness of it's work/