ODESSA NATIOANAL ACADEMY
OF FOOD TECHNOLOGIES

THE SYSTEM OF THERMAL UTILIZATION OF HEAT AND DUST OF THE PRODUCT

The purpose and scope of application

The technical idea of the construction is that a thermal utilization device (TUD) uses two-phase thermosyphon (TS). Evaporators are heated by the spent heat carrier. TS condensing sections through the pipe board are withdrawn to the cold heat carrier chamber. Here, the outside air is heated and fed into the heat source into the mixing chamber. In addition to reducing fuel consumption, environmental problems are simultaneously being addressed: the degree of environmental pollution is reduced by thermal emissions, in addition, gas emissions in the hot-flow chamber of the TUD are in part dehydrated. Despite the fact that they have separate surfaces for evaporators and condensers, their design advantages give a significant effect. On average, the coefficient of heat transfer in them is 4 ... 6 times higher than that of traditional devices. The coefficient of effective heat transfer to the TS surface with a rolling-screw finning reaches 2000 W / m^2 K.

Intellectual Property Protection Status

One patent were obtained.

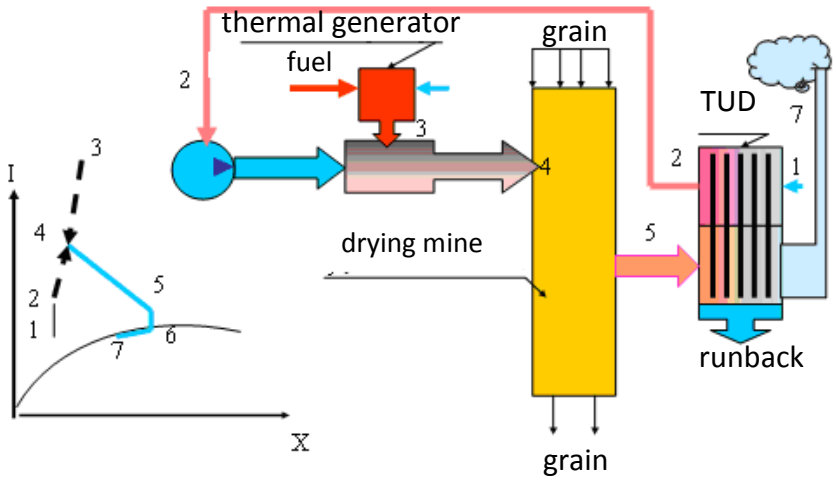
Market claimed and state of development

Important parameters that characterize the level of scientific results

Table. Technical and economic characteristics of the heat utilization systems of mine direct-flow grain dryers

Dryer type	Gas consumption, m^3/sec	Number of TS	Power, kW	Fuel economy, %	TUD payback, years
DSP-16	10,4	370	245	17	0,9
	6,4	224	150	9,5	
DSP-32	22,2	780	420	14	0,7
	11,7	400	230	8	
SZH-18	7,5	260	160	10,3	1
	3,9	136	75	5	
LSO 11	25	880	500	13	0,75
M819	6,7	232	135	7,5	1

In the calculations, the three-shift operation of the plant was taken within 100 days.
The results of industrial tests of such a heat utilization plant on a grain dryer DSP-32 showed that the heat transfer coefficient was 60 ... 140 W / m^2 K.



1-2 – warmed air in TUD;
3 – parameters of fire-box gases;
4 – parameters drying to the agent;
4-5 – process of drying;
5-6 – cooling of coolant-moderator;
6-7 – cooling and dehydration of extrass of coolant-moderator

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