

**THERMAL POWER SOLAR-FUEL DRYERS OF CRADLE-CONVEYOR TYPE**  
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**Abstract:** the paper considers the thermal output of solar-fuel dryers of cradle-type conveyor heated by direct entry of solar and infrared radiation. The infrared drying can reduce drying time, providing additional heat to accelerate drying. IR radiation energy transmitted from the heating element to the product without heating the surrounding air. Drying process intensification through the ability to control the amount of fresh air entering into the working chamber and the heat recovery process in the IR drying and heat flux distribution simulation in the working chamber by means of a computer program TracePro.

**Keywords:** drying, heat capacity, intensification, process, air.

**ТЕПЛОВАЯ МОЩНОСТЬ СОЛНЕЧНО-ТОПЛИВНОЙ СУШИЛКИ ЛЮЛЕЧНО-  
КОНВЕЙЕРНОГО ТИПА**

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**Аннотация:** в работе рассмотрена тепловая мощность солнечно-топливной сушилки люлечно-конвейерного типа, нагреваемой прямым поступлением солнечного и инфракрасного излучений. ИК-сушилка позволяет уменьшить время сушки обеспечением дополнительного тепла для ускорения сушки. Энергия ИК-излучения передается от нагревательного элемента на продукт без нагревания окружающего воздуха. Интенсификации процесса сушки за счет возможности контроля количества поступающего свежего воздуха в рабочую камеру и использования вторичного тепла в процессе ИК-сушки, а также моделирование распределения теплового потока в рабочей камере с помощью компьютерной программы TracePro.

**Ключевые слова:** сушка, тепловая мощность, интенсификации, процессе, воздуха.

This trend is dried directed to combining various modes of heat transfer to improve the kinetics of drying of the product along with improving its quality. Many dryers convective type is easy to install infrared radiation using low-cost and reliable IR emitters. IR drying can reduce drying time providing additional heat for faster drying. IR energy transmitted from the heating element to the product without heating the surrounding air. Not that scientists have shown significant advantages infrared drying [1-3]. These advantages include the following: a high coefficient of heat transfer (up to 100 kW/m<sup>2</sup> in the paper industry); easy to direct the heat source in the drying surface; easy and fast control of the process (if necessary); combination of simplicity and low cost of infrared radiation in the existing design of heat pump dryers.

In [4] presented the results of tests belt dryer with microwave and infrared energy generators. Based on the results of studies [5] designed vertical IR dryers, the benefits of which are to: decrease the duration of the drying process by forced convection; improving the quality of the final product by heating a soft and low temperature; uniform thermal field on the receiving surface by the cylindrical shape of IR dryers; reducing the dimensions and ease of construction by rectangular carboxylic infrared heaters in the chamber; drying process intensification through the ability to control the amount of fresh air entering into the working chamber and the heat recovery

process in the IR drying and heat flux distribution simulation in the working chamber by means of a computer program TracePro [5].

In figure 1 it shows the distribution of the heat flux in the air gap between the cover and the wall of the drying chamber at the height of the camera [6-7].

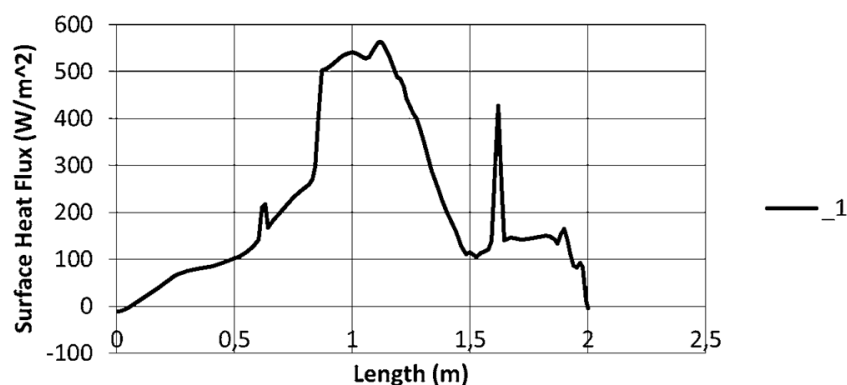


Fig. 1. The distribution of the heat flux in the air gap between the cover and the wall of the drying chamber at the height of the camera

As can be seen from the graph, the heat flux leaving the unit of surface area of the drying chamber in the middle of the air gap, reaches up to  $560 \text{ W/m}^2$ . This value indicates that this surface incident solar radiation intensity of  $800 \text{ W/m}^2$ .

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