

# SOLAR DRYER FOR DRYING OF MARINE PRODUCTS

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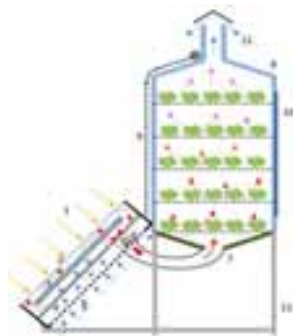
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## 1. Introduction

At present time mainly two directions of technical development of solar drying systems exists, which meet the technical, economical and socio - economical requirements: 1) simple, low power consumption, short life, and comparatively low efficiency-drying system; 2) high efficient, high power consumption, long life expensive drying system [1,2]. In the current work design and mathematical description of thermal performance analysis of solar dryer for agricultural and marine products are presented. Proposed solar dryer includes two main subunits: 1) Solar PV-Thermal air dehydrator; 2) Drying cabin with multistage trays.

## 2. Solar Dryer

Developed design of proposed Solar dryer, with solar *PV-Thermal air dehydrator*, which is used as heat source for dryer and *drying cabin* with multistage trays, where will be placed agricultural or marine products to dry presented in Fig. 1. And created experimental unit which is presented in Fig. 2.



**Fig. 1. Principal Scheme of Solar Dryer.**

1-Solar radiation; 2- light transparent cover; 3-PV module; 4-Absorber and inlet of an air flow; 5-Back side; 6-Air fan; 7- Air input channel; 8-Korpus of Drying cabin; 9-Extra cover for reflect and absorb of solar radiation; 10-Door of drying cabin; 11-Outlet chamber for an air.



**Fig. 2. General view of experimental setup of solar dryer**

Solar PV-Thermal air collector consists of rectangular box with light transparent cover from one side, PV module, which is placed inside of the collector, second absorber layer with insulation. There is air fan placed, which runs by the PV module, to circulate air through collector and direct heated air to the drying cabin. Drying cabin consists of rectangular Polycarbonate box with inlet and outlet holes from bottom and top for air circulation and multistage trays (respectively with holes) inside for putting of drying products.

Mathematical description of the thermal performance of proposed dryer: Developed mathematical model of the thermal mode and numerical calculations have been done on determination of thermal-technical performances of each components and a whole solar dryer. Determination of technical parameters of the hole system could be achieved by analyzing of parameters of each including components. On this basis developed system of energy balance equations for each component. Simulations run on MathcadPro-2001 by following modified Algorithm for proposed system.

## References

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