

THE PERFORMANCE STUDY OF A SOLAR FLAT PLATE TYPE AIR COLLECTOR WITH NATURAL AND FORCED CONVECTION

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ABSTRACT

In developing world, the usage of fossil fuel and electricity charges are being increased day by day and they produce more environmental pollution. In intention of the above factor, there is need to develop alternative energy with low cost. Solar power is one of the best ways to produce energy. Solar flat plate type air collector (SFPTAC) is widely used for many solar applications. Drying of agricultural food products is attractive and cost-effective application of solar power as it becomes a potentially viable substitute for fuel-wood in major development of the world. A SFPTAC is 2 × 1 m² area and 5 mm thick aluminium sheet is coated with a black paint. An insulated collector of about 10cm thickness and inside is covered by the glass wool of thickness 25 mm are used on the surface of the enclosure. These tests were conducted to gather data from different atmospheric conditions. The results were examined by both the free and forced convection.

INTRODUCTION

The sun is the composed of all renewable energy sources. This renewable energy should be clean, safe and free. Application of these sources of energy is utilised by millions of people at various places. One of the most excellent in future development area of the application of solar energy is SFPTAC.

SFPTAC with the help of solar energy is utilised for a variety of purposes. These devices are simple and easy to construct at low cost. A SFPTAC consists of transparent glass cover, absorber plate, insulating materials, drying trays and air blower. The air is passed through in between the absorber plate (AP) and the transfer glass cover. At the same time solar radiation is absorbed by AP and the absorbed heat air is passed through the channel into the drying trays. This heated air can be utilized into many more applications such as drying agricultural products, space, water and industrial process heating and air

conditioning. Technically, there are two methods used for usability solar energy; they are Convictional and Non-convictional heating. An example for Convictional solar techniques is natural circulation without external force and Non-convictional solar techniques like forced convection includes pumps, air blower or fans.

LITERATURE REVIEW

Reviews of the literature survey are very useful to analyse the experiments. At the expense of growth in the world's energy consumption, sources of conventional energy are the emergent need of the world. But conventional energy sources such as fossil fuels have two main limitations. First, they are limited in size, and they produce environmental pollution. Hence there is a need for alternative fuel renewable energy source to eliminate the demerits. There is less knowledge about the sources and replacement systems and the usage of these resources. Hence

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