

عنوان مقاله:

The Possibility of using Flat Plate Solar Collector Based on the Best Calculated Tilt Angle in the City of Rasht as a Case Study

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خلاصه مقاله:

The possibility of using flat plate collector in northern parts of Iran specially city of Rasht has been investigated in this paper. Due to the high humidity in the northern parts of this country, diffuseradiation plays a more important role than direct radiation. This fact can change the results of delivered solar energy and the best tilt angle of the collector compared to the sunny central cities. Therefore, maximum solar energy based on the best tilt angle is calculated first. Relative to the horizontal collector, changing the tilt angle, the daily, monthly, seasonally and yearly delivered solar energy increases 16.58%, 15.84%, 15.31% and 10.79%, respectively. Then, the steady state two dimensional equation of conduction for the collector plate has been solved to obtain the length of the collector required for heating the water to a desired temperature 20 meters of a typical collector (10 numbers) increases the water temperature to 66 and 85°C in the months December and September, respectively. Mean efficiency of the collectors decreases with increasing the temperature of inlet water. That is, the efficiency of the first and tenth collectors is approximately 60% and less than 10% respectively.

کلمات کلیدی:

Flat Plate Solar Collector Collector Tilt Angle Thermal Analysis Collector Efficiency

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