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# EXPERIMENTAL STUDY OF DESIGN AND FABRICTION OF HEXAGONAL REFLECTOR USING CIRCULAR PLATE SOLAR COLLECTOR

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## Abstract

***The hexagonal solar heat collector experimental setup has been designed & fabricated. This experimental setup concentrates the solar-heat energy, the collector got the energy from concentrated radiation using the flat mirrors. This designed experimental setup is working on reflection of light principle. The Hexagonal solar reflector focuses coordinated radiation from the sun toward the collector. Radiation from the sun directly transformed into heat and transfer to heat collector, maximizing the concentrated energy from the reflector mirrors are used so sun rays are reflected into and concentrated into the collectors. The study and behaviour of solar heat collector, here an experimental setup has been design developed for conducting the experiments with position of sun. From these experiments maximum temperature has been achieved and done the analysis the behaviour of model.***

**Keywords:** ***Hexagonal shape reflectors, Circular jar, Solar energy, solar flat plate collector.***

## 1. Introduction

Energy is to produce work on a body or warm it, energy must be transferred to the body or physical system. There is a law of conservation of energy stated that energy cannot be created nor destroyed, it can be converted and transferred from one form to another. As a moving object moves through a force field, the potential energy it stores is stored (gravitational, electrical or magnetic), elastic energy is stored when solid objects are stretched and chemical energy is released when liquids dissolve in water Mass and energy are closely related. There are several types of energy that are produced by burning substances: radiant energy, thermal energy, and kinetic energy. The potential energy of a system can be classified into potential energy, kinetic energy, or combinations of the two. A potential energy is a measure of the probability of an object being able to move, and is generally related to the object's position within a field. Active energy cannot be disturbed by the development of an item - or the composite movement of the instrument itself - while active energy transcends the development of an item.

**Solar Energy-**

Solar energy is a renewable source of energy. It is the world largest rich source of energy which produces radiations to heat the water. In India, solar energy is mostly used to generate power, households etc. It is a radiant light and heat from sun that's natural source of energy using a range of ever changing and developing of technology similar as solar thermal energy, solar armature, solar heating, molten swab power factory and artificial photosynthesis (Mohd Rizwan Sirajuddin Shaikh et al, 2017). Solar light is collected on plates on the roof and heat transferred to a circulating water system. The application of solar powered vitality is a completely benevolent exertion. Sun powered power can likewise be applied as solar-mild based totally energy by percent or solar primarily based cells. Due to their non contaminating characteristic world, solar acquainted cells are known as pristine and green cells. Solar based power being green energy or sustainable energy for electricity development and suits into the rule of maintainability.

## 2. Explanation of Graphs

From the fig 1 and 2 – it is clearly exhibited that the hourly temperature of the ambient temperature and experimental temperature has been shown. The experiment has been conducted with variation of solar heat collector and Ambient temperature during 9 am to 4 pm has been taken. It is clearly shown from the fig 1 & 2 during 1pm to 4 pm the temperature of water increases with ambient temperature increases because from 1pm to 4 pm radiation and convection is higher. The maximum reflection of the sun rays has been achieved. At the time of morning 9 am the

ambient temperature is 25°C and water temperature is 12°C.

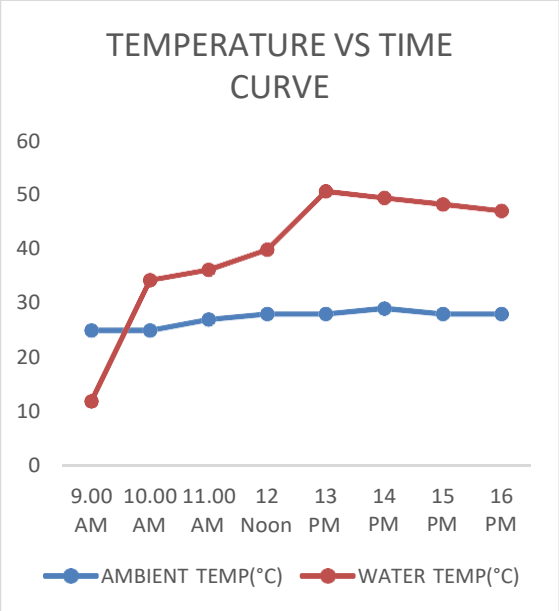


Fig1: Ambient Temp vs solar heat collector on 18 Sep 21

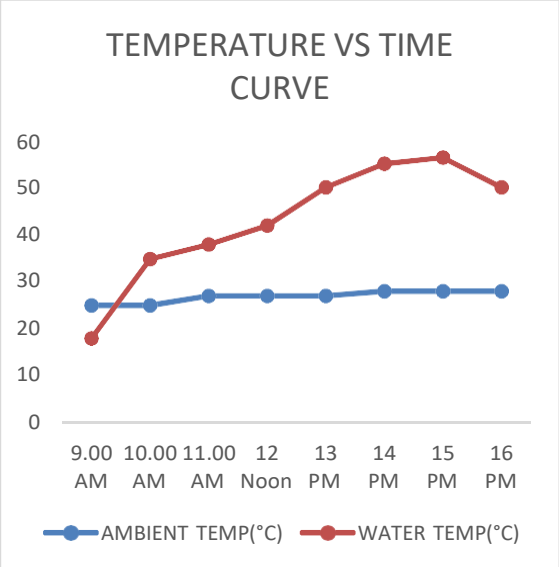


Fig2: Ambient Temp vs solar heat collector on 20 Sep 21

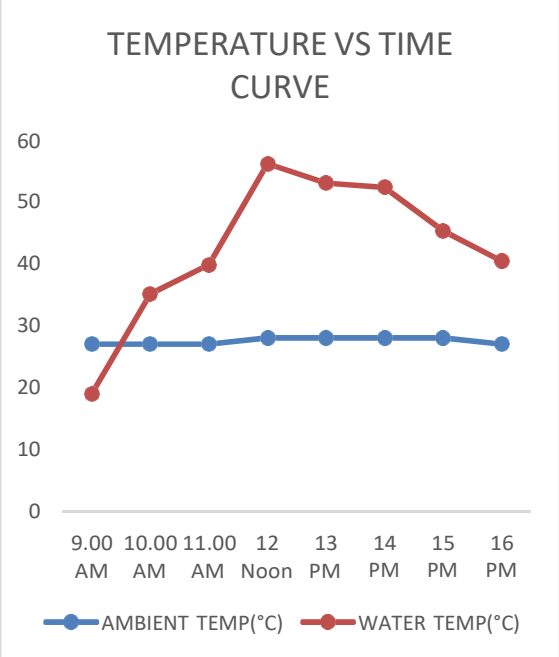


Fig3: Ambient Temp vs solar heat collector on 28 Sep 21

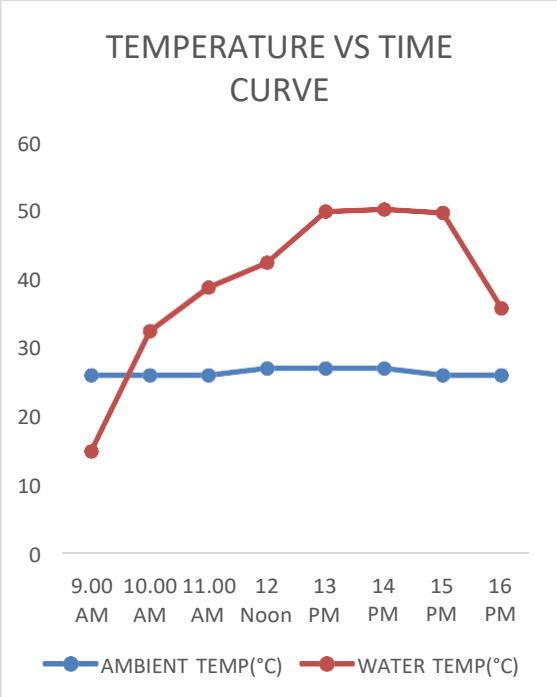


Fig4: Ambient Temp vs solar heat collector on 04 oct 21

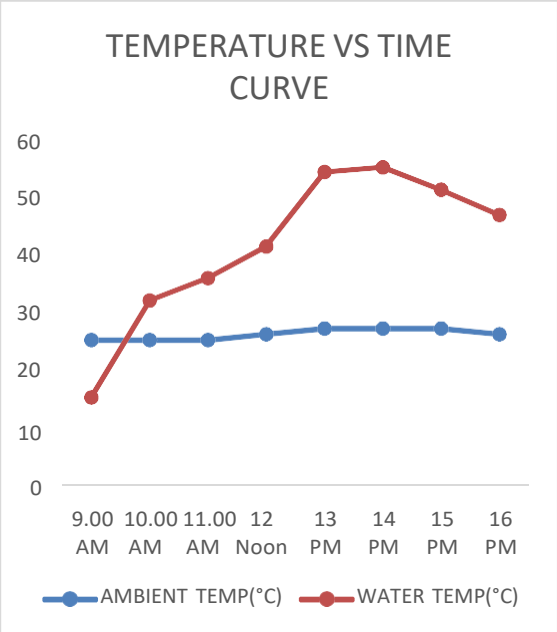


Fig5: Ambient Temp vs solar heat collector on 05 oct 21

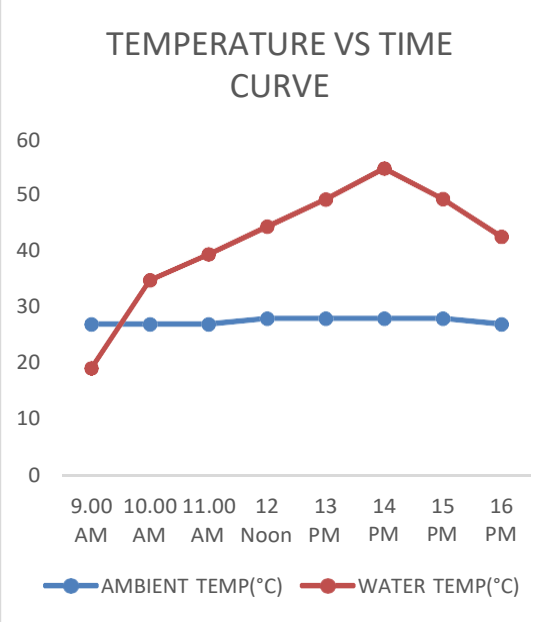


Fig6: Ambient Temp vs solar heat collector on 07 oct 21

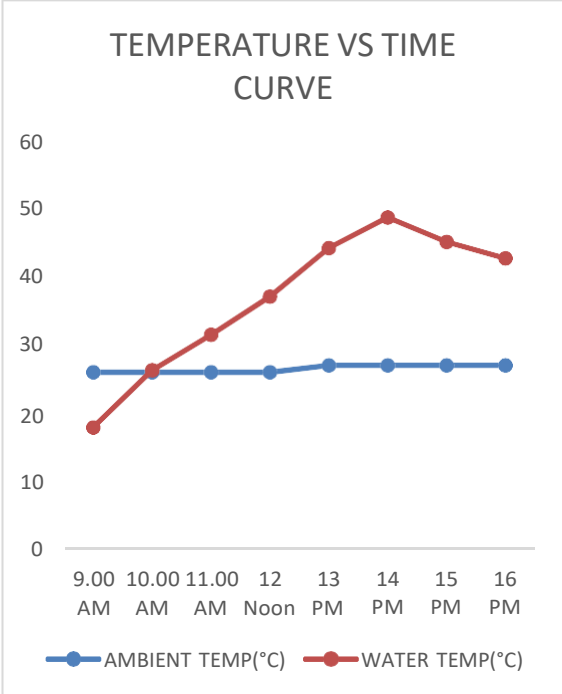


Fig7: Ambient Temp vs solar heat collector on 11 oct 21

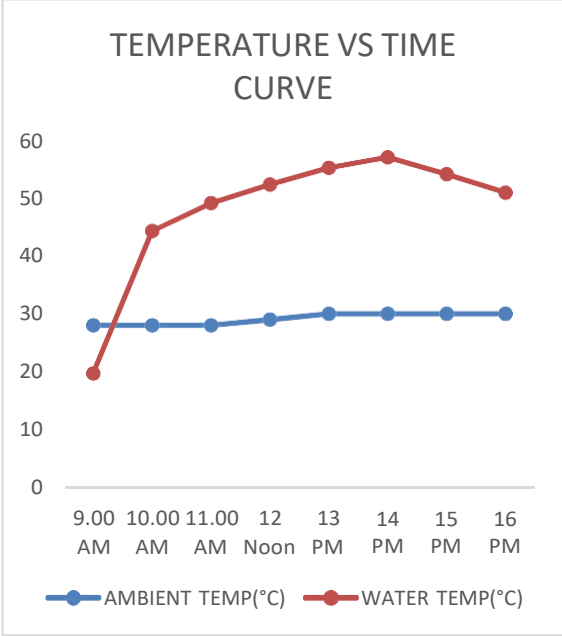


Fig8: Ambient Temp vs solar heat collector on 13 oct 21

## 3. Discuss and Conclusion

From all above mention figures it has been observed that as the ambient temperature has increases then the solar heat collector temperature also increases. It is observed that in the noon session of in all days of experiments due to higher solar radiation the temperature of the model also increases. The maximum model temperature has been achieved 570C which has been shown in figure 8. But the ambient temperature had 300C.

In the figure 5, 6 and 7 the similar pattern has been shown. The solar heat collector due to solar radiation the which has been increases by the angle of reflection by the mirror by that here radiation of the collector has been increases.

At the different angle of mirror, the experimental temperature has been enhanced. The position of the angle of the flank are hexagonal so that set can convert the maximum ray to the collector and mean position try to achieved. The combination of the mirror angle means flank angle that produced the position of the model where the maximum radiation has collection near the collector. So, the local area near about the collector. Temperature has raised by that absorption rate of the collector also increase. In the solar heat collector here, we used the black colour in the surface of the body so that radiation absorption also increases in then collector.

It has been also observer that the local area near about the collector due to radiation and reflection of the sun light temperature is increase so, here maximum temperature has been achieved. This experiment setup will produce more temperature in the summer session. That will helpful for all session in the different application of domestic and industrial area.

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