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# TO STUDY AND ANALYSIS OF SOLAR WATER HEATER USING VARIOUS MASS FLOW RATE

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**Abstract:**
***Solar water heater is a device which is used for heating the water using of sun energy. This system is connected like as storage tank, centrifugal pump, pipes and glass. The circulating flexible water pipes are connected with the metallic pipe, which are assembled with the body. The solar radiation are achieving from sun and passing although glass and collector for the purpose of the heating the circulating water. In this way we are achieving the various temperatures using of circulating pump.***

**Keywords:** *Solar Water Heater; Solar Collector; Flexible Water Pipe; Metallic Pipe.*

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## 1. Introduction

Most flat plate collectors are having two horizontal pipes at the very best and bottom, referred to as headers, and much of smaller vertical pipes connecting them, referred to as risers. The risers are welded (or equally connected) to skinny absorbent fins. Heat-transfer fluid is tense from the recent water storage tank or device into the collectors' bottom header and it travels up the risers, collecting heat from the absorbent material fins, and so exits the collector out of the very best header.

The development is simple and low construction value. During this approach no fuel consumption and having the zero emission by this reason saving the energy and keeping the atmosphere free.

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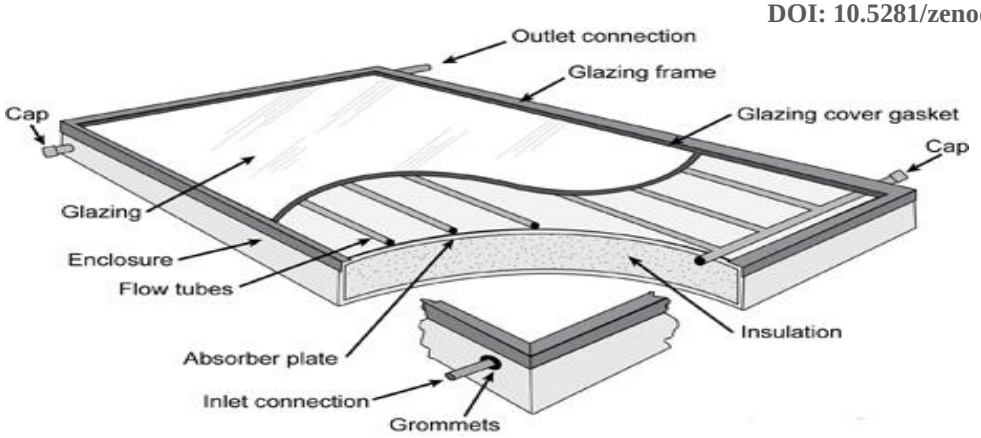

Figure 1: solar water heater

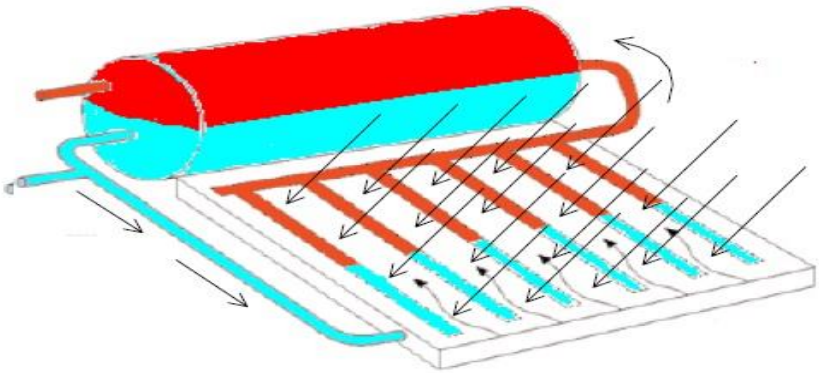
Figure 2: incident solar rays

## 2. Parts of A Solar-Thermal Hot-Water System

### 2.1. Collector

The collector is devices that are collected the radiation from sun energy. The heats are storages in box that has black paint coating. The pipes are connected with box for the aim of the moving water with the assistance of current pump.

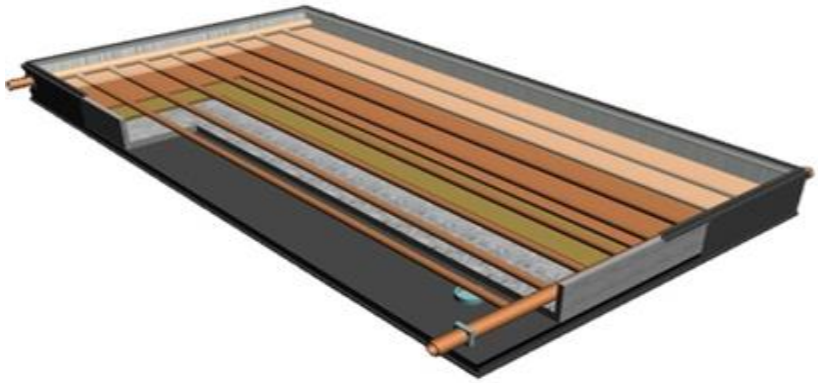
Figure 3: Collector

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### 2.2. Hot Water Tank

Hot water tank are a instrumentation that are collected the water and, during this means water current pump are rest in tank and flow into the water with the assistance of pipes

## 3. Result and Discussion

Table 1: Time and temperature with water flow rate 2 litres/ Minutes

| Sr. No. | Time | Temperature in degree C |
|---|---|---|
| 1 | 10:00 | 32 |
| 2 | 11:00 | 34 |
| 3 | 12:00 | 38 |
| 4 | 13:00 | 42 |
| 5 | 14:00 | 43 |
| 6 | 15:00 | 44 |
| 7 | 16:00 | 41 |
| 8 | 17:00 | 39 |

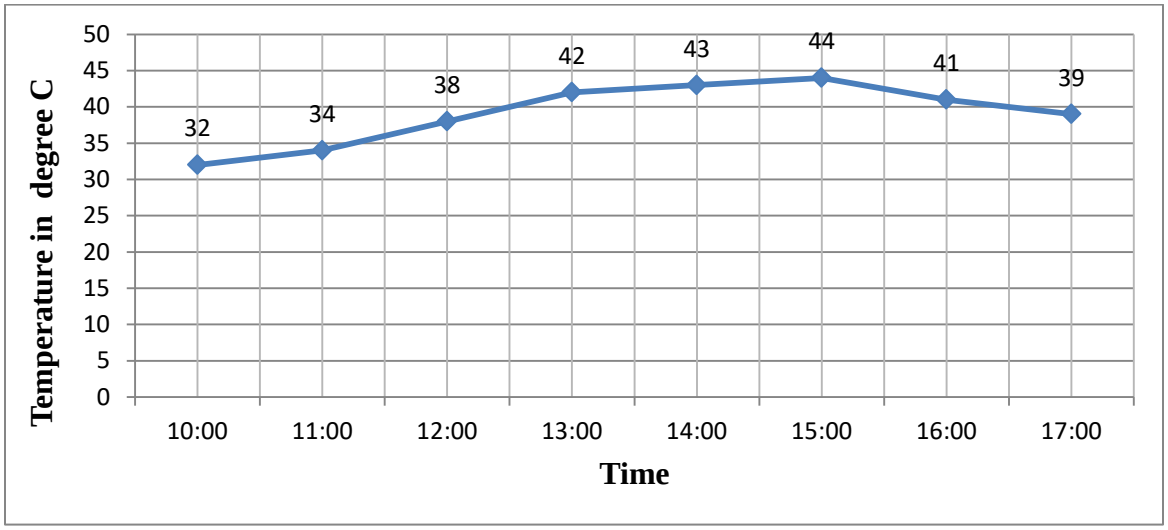


Figure 4: Time and temperature with water flow rate 2 litres/ Minutes

Table 2: Time and temperature with water flow rate 4 litres/ Minutes

| Sr. No. | Time | Temperature in degree C |
|---|---|---|
| 1 | 10:00 | 32 |
| 2 | 11:00 | 39 |
| 3 | 12:00 | 43 |
| 4 | 13:00 | 45 |
| 5 | 14:00 | 46 |
| 6 | 15:00 | 44 |
| 7 | 16:00 | 42 |
| 8 | 17:00 | 40 |

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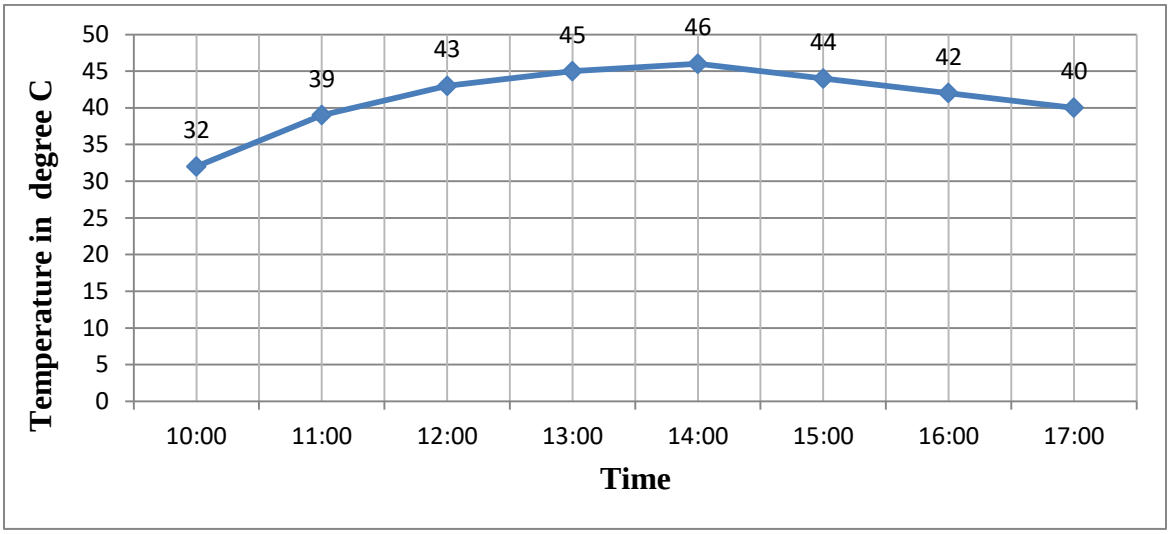


Figure 5: Time and temperature with water flow rate 4 litres/ Minutes

Table 3: Time and temperature with water flow rate 6 litres/ Minutes

| Sr. No. | Time | Temperature in degree C |
|---|---|---|
| 1 | 10:00 | 32 |
| 2 | 11:00 | 43 |
| 3 | 12:00 | 48 |
| 4 | 13:00 | 52 |
| 5 | 14:00 | 55 |
| 6 | 15:00 | 52 |
| 7 | 16:00 | 48 |
| 8 | 17:00 | 44 |

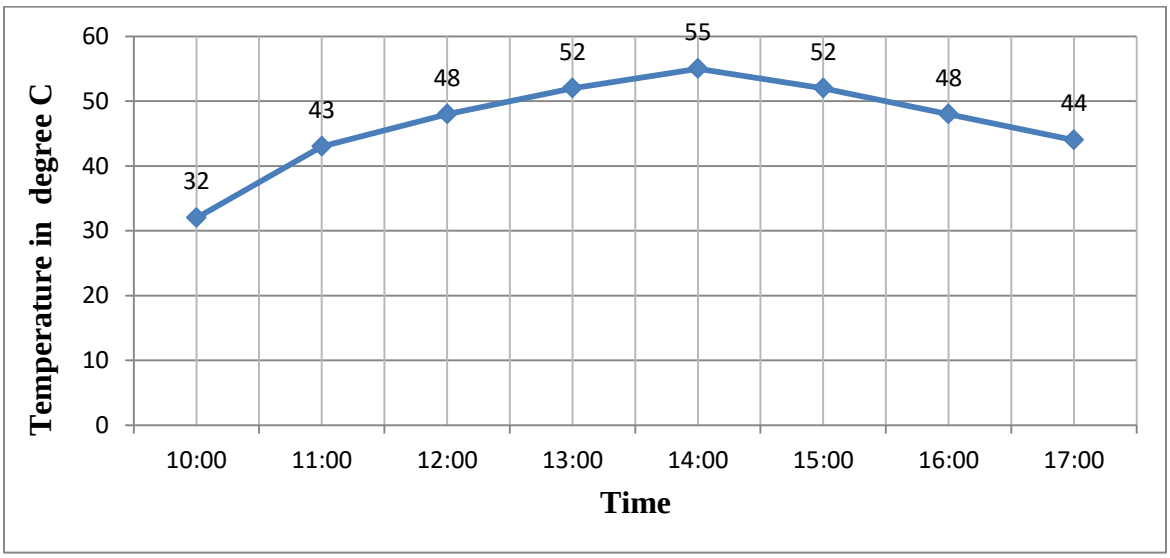


Figure 6: Time and temperature with water flow rate 6 litres/ Minutes

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Table 4: Time and temperature with water flow rate 8 litres/ Minutes

| Sr. No. | Time | Temperature in degree C |
|---|---|---|
| 1 | 10:00 | 32 |
| 2 | 11:00 | 48 |
| 3 | 12:00 | 50 |
| 4 | 13:00 | 62 |
| 5 | 14:00 | 64 |
| 6 | 15:00 | 58 |
| 7 | 16:00 | 52 |
| 8 | 17:00 | 49 |

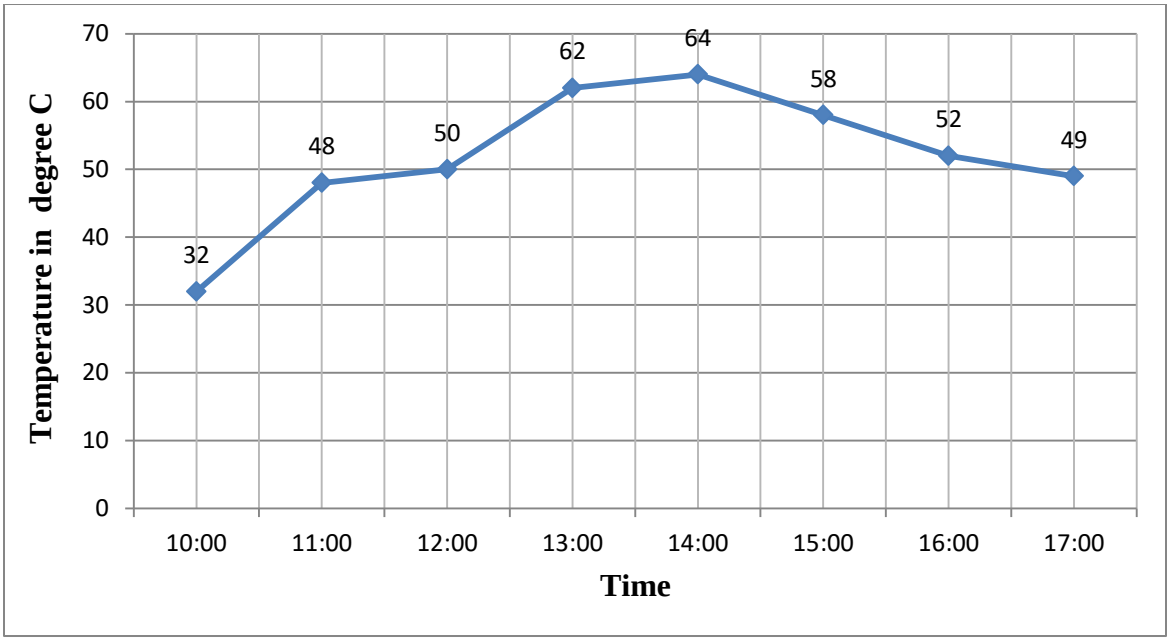


Figure.7: Time and temperature with water flow rate 8 litres/ Minutes

Table 5: Time and temperature with water flow rate 10 litres/ Minutes

| Sr. No. | Time | Temperature in degree C |
|---|---|---|
| 1 | 10:00 | 32 |
| 2 | 11:00 | 47 |
| 3 | 12:00 | 48 |
| 4 | 13:00 | 57 |
| 5 | 14:00 | 58 |
| 6 | 15:00 | 52 |
| 7 | 16:00 | 46 |
| 8 | 17:00 | 44 |

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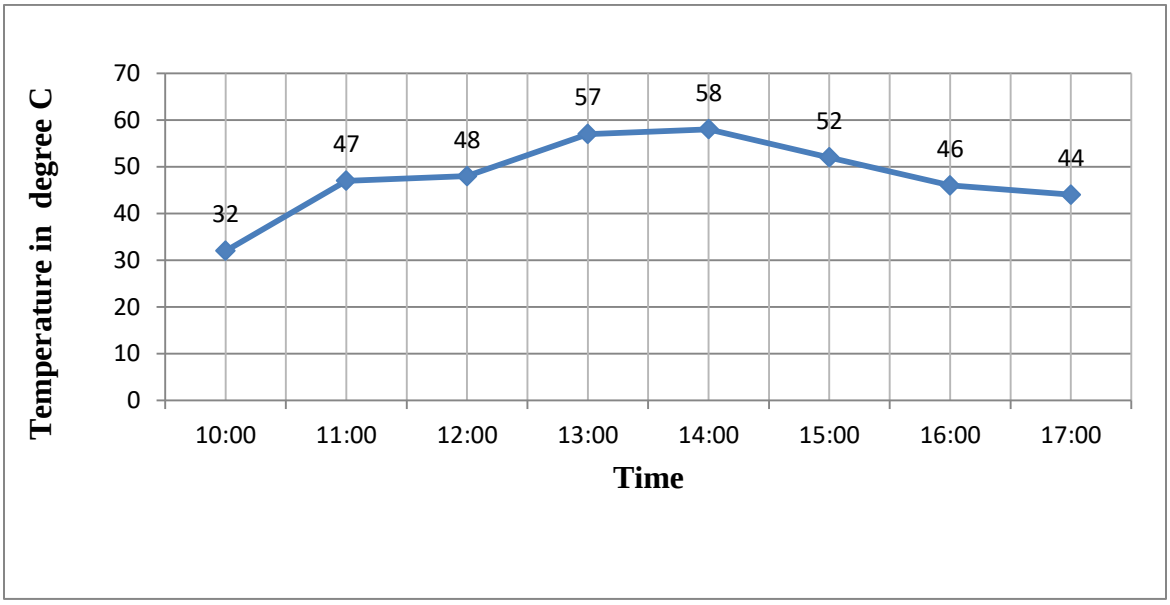


Figure 8: Time and temperature with water flow rate 10 litres/ Minutes

## 4. Conclusion

The intensity of sunlight is high to get more efficiency and heat gain. The reading are taken time from 10:00 to 17:00 with various mass flow rate, after this we are achieving the maximum temperatures as 64C at the time 14:00 during water flow rate 8 litres/ Minutes., which are shown in table 4.

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