



## EXPERIMENTAL STUDY OF SOLAR AIR HEATER USING OF PHOTOVOLTAIC CELLS

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### Abstract:

*In this paper, we are studying about solar air heater. The solar air heater are consisting the several component such as flat glass, collector, D.C. fan, photovoltaic cells and electrical storage system. In this study we are achieving the various type of outlet temperature with the help of D.C. fan and various Mass air flow rate using of simple absorber trays forced convection.*

**Keywords:** Collector; Photovoltaic Cells; Electrical Storage System; D.C. Fan.

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## 1. Introduction

The solar air heater is achieving the solar radiation from sun energy after this collector has as a hot air storages. Using of D.C. fan we are obtaining the maximum outlet temperature and electrical storage system such as battery. The electrical power supply are achieving from PV Cells and after that the achieved energy are storage in battery for purpose of the running the fan.

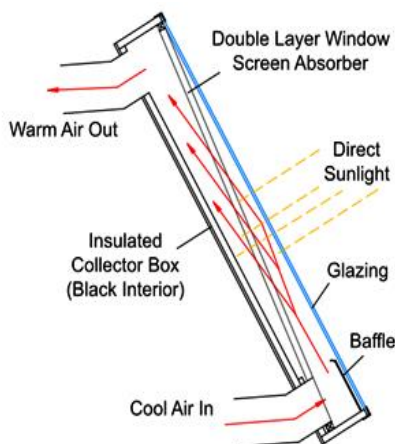


Figure 1: Solar Air Heater



Figure 2: Flats Plate Glass

## 2. Seven Requirements for a Successful Design

- 1) Passive operation
- 2) Diurnal operation
- 3) Season-dependent heating
- 4) Maximum reliability
- 5) Long service life
- 6) Minimum maintenance
- 7) Low-cost

## 3. Temperature Meter

Temperature meter has capacity upto 99°C



Figure 3: Digital Temperature measurement device

**4. Results and Discussion**

Table 1: Mass air flow rate at 0.10 kg / sec using of simple absorber trays forced convection

| Sr.No. | Time In hours | Temperature in °C at inlet | Temperature in °C at outlet |
|--------|---------------|----------------------------|-----------------------------|
| 1      | 10:00         | 25                         | 37                          |
| 2      | 11:00         | 30                         | 40                          |
| 3      | 12:00         | 33                         | 42                          |
| 4      | 13:00         | 40                         | 45                          |
| 5      | 14:00         | 41                         | 44                          |
| 6      | 15:00         | 35                         | 41                          |
| 7      | 16:00         | 32                         | 37                          |

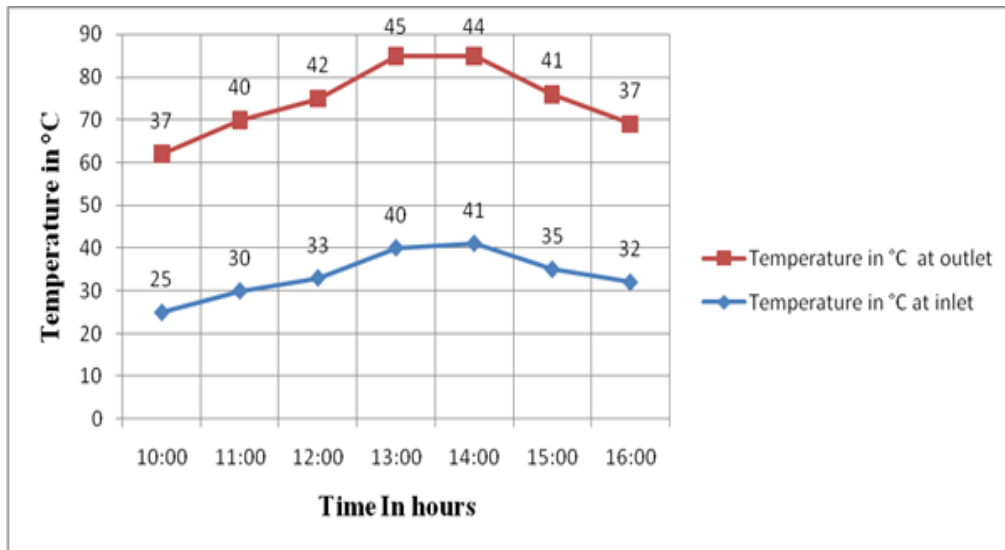


Figure 4: Mass air flow rate at 0.10 kg / sec using of simple absorber trays forced convection

Table 2: Mass air flow rate at 0.20 kg / sec using of simple absorber trays forced convection

| Sr.No. | Time In hours | Temperature in °C at inlet | Temperature in °C at outlet |
|--------|---------------|----------------------------|-----------------------------|
| 1      | 10:00         | 26                         | 38                          |
| 2      | 11:00         | 31                         | 42                          |
| 3      | 12:00         | 35                         | 45                          |
| 4      | 13:00         | 40                         | 52                          |
| 5      | 14:00         | 41                         | 47                          |
| 6      | 15:00         | 34                         | 46                          |
| 7      | 16:00         | 30                         | 44                          |

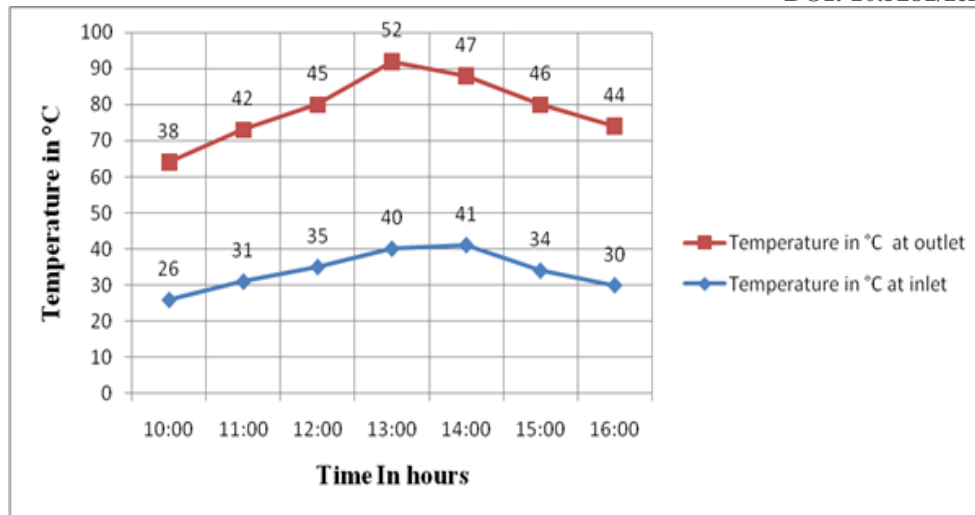


Figure 5: Mass air flow rate at 0.20 kg / sec using of simple absorber trays forced convection

## 5. Conclusion

In this experimental study we are finding out the maximum outlet temperature 52 °C at the time 13:00 with Mass air flow rate at 0.20 kg / sec using of simple absorber trays forced convection, which is shown in figure .2. In this type solar air heater are using for several application because of we are using the photovoltaic cells.

## References

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