



CASE STUDY - Coorg Institute of Technology

STUDY:

Solar Water Heating System are very commonly used in Hotels, Hospitals, and Industrial Canteens and in Boiler Pre Heating application. It is possible to design Solar Water Heating System to provide hot water upto 80°C. There is no limitation in the capacity of the system.

Normally, we design for Hotel, Hospital requirements, the system as either THERMOSIPHON OR CLOSED LOOP CIRCULATION SYSTEM. In the case of Thermosiphon, there is no pump and the circulation between the solar panel and the tank is due to density difference. Normally, such systems are designed up to 3000 litre capacity. In the case of closed loop system, a pump is provided and activated by a control panel for circulating the water between the solar tank and solar collectors. In these types of system, the cold water from the overhead tank is connected directly to the solar tank and the hot water from the solar tank to the usage point is taken from the top of the tank. These systems are ideal for bathing requirements of hot water during non-Sunny hours.

SOLUTION:

For canteen and Boiler Pre Heating applications, system is designed as OPEN LOOP SYSTEM. In this case, the cold water is pumped directly to the solar collectors and the hot water is collected in the solar tank. In such case, the temperature of hot water from the solar collector can be pre fixed. There is no mixing of cold water with the hot water at the time of usage. These systems are preferred in places, where the usage of the hot water is during the day time and also required at very high temperature.

Excepting in the case of thermo siphon system, the collectors can be located separately and the tank can be at convenient location. The number of solar collectors required depends on the capacity of the system and temperature to be heated up from the system. The solar tank is made of stainless steel material and insulated to retain hot water for 48 hours.



Generally, to arrive at the capacity of the system, we assume 25 liters per person per bath. From this calculation the capacity of the system is arrived at. For bathing purpose, 60°C systems are advisable and for other purposes 80°C systems are preferred. The outlet from the solar system to the usage point should be suitable hot water pipes.

It is advisable to contact us before carrying out the hot water pipelines. Generally, hot water pipelines are insulated in order to retain loss in temperature of hot water while flowing. For 1000 litres system for example, we use 8 solar collectors of 2 sq.m. area each, totally occupying 240 sq.ft. And for 1000 litres 80°C , 10 solar collectors occupying 280sq.ft is used.

Generally the solar systems have a life span of 15 years and maintenance cost is as low as 5% of the plant cost, per annum. It is preferable to use potable water for the system.