



## FLAT-PLATE COLLECTORS

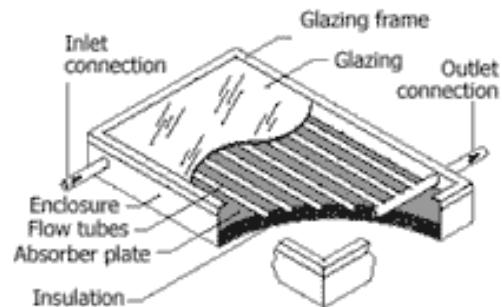
Flat Plate Collectors have been the mainstay of solar systems for forty years. They are a simple, tried-and-true technology. They work great during the summer months, but, they are not able to take the most advantage of the sun during the shorter days of winter. This is the time that Evacuated Tube Collectors really surpass the performance of flat-plates. (See our information about Evacuated Tube Collectors and Passive Solar Tracking.) Mirasol Solar Energy Systems uses Solar Panels Plus Evacuated Tube (ETs) Collectors for most all of our installations because of their superior performance during the winter. ETs require more design expertise to plan a system, but, Mirasol Solar Energy Systems has the technical ability required.

Some other disadvantages of flat-plates is that more panels are needed than ETs. For a larger application, using flat-plate collectors can be more expensive because more are needed. Flat Plates are heavier than ETs--putting a lot of weight on the roof. They require two people to install them so installation is costs are more. In our opinion, flat-plate collectors are especially good for the installer to make more money from repeat business. Eventually, the insulation in the collectors de-gas and you need to replace them. (ET's use a vacuum for insulation and will last a lifetime. They are a greener product.) However, we do understand that many people continue to prefer flat-plate collectors and we respect that.

There are many high-performing flat-plate collectors available on the market. If the customer chooses to use flat-plate collectors, we will be happy to install them. In cases where only one collector is needed, such as for a simple water heating system, a flat-plate collector may be optimal because it is less expensive. We will always strive to make a solar system affordable so that everyone, regardless of budget, can install solar.

We feel that the difference between one flat-plate collector and another is the price and the quality of the material used. If a flat-plate collector is preferred, we will propose a collector that is the best value for our customer without prejudice.

A typical flat-plate collector is a metal box with a glass or plastic cover (called glazing) on top and a dark-colored absorber plate on the bottom. The sides and



bottom of the collector are usually insulated to minimize heat loss.

Sunlight passes through the glazing and strikes the absorber plate, which heats up, changing solar energy into heat energy. The heat is transferred to liquid passing through pipes attached to the absorber plate. Absorber plates are commonly painted with "selective coatings," which absorb and retain heat better than ordinary black paint. Absorber plates are usually made of metal—typically copper or aluminum—because the metal is a good heat conductor. Copper is more expensive, but is a better conductor and less prone to corrosion than aluminum. In locations with average available solar energy, flat plate collectors are sized approximately one-half- to one-square foot per gallon of one-day's hot water use.

## SPP EXPLAINS WHY THEY NO LONGER OFFER FLAT-PLATE COLLECTORS

*"Evacuated heat pipe tubes are designed such that convection and heat loss are eliminated, where as Flat-plate solar panels contain an air gap between absorber and cover plate which allows heat loss to occur. Further, thermal heat pipe systems are capable of limiting the maximum working temperature, where as Flat-plate systems have no internal method of limiting heat buildup which can cause system failure. Finally, evacuated heat pipe systems are lightweight, easy to install and require minimal maintenance. Flat-plate systems, on the other hand, are difficult to install and maintain, and must be completely replaced should one part of the system stop working."* –SPP website