

How do Evacuated Tube Solar Collectors Work?

Research and development work for the SEIDO line of evacuated tubes using heat pipe technology was carried out by the Daimler-Benz Aerospace Group.

An evacuated-tube collector contains several individual glass tubes, each containing an absorber plate bonded to a heat pipe and suspended in a vacuum. The pipe transfers the heat efficiently to a condenser through the top of the tube. The condensers are clamped to heat exchange blocks in a well-insulated manifold. The special coating on the absorber absorbs more than 92% of the arriving radiation, but radiates less than 8% back to the environment.



A heat pipe is a closed system, carefully evacuated and charged with a small amount of water before it is sealed. The absorber imparts heat to this water, causing it to evaporate. The steam rises to the upper end of the heat pipe where it transfers heat to the fluid circuit via a metallic conduction bridge. Being a "dry" connection, fluid in the heating circuit does not flow through the collector.

Our Effort

To ensure a high level of customer satisfaction with our products, technology and service. Whether residential, commercial, or institutional applications, Canadian Solar Technologies Inc. and SUNDA draws on a world of experience to provide you with qualified technical support in planning custom solar thermal systems at a competitive price.



For more information on SUNDA evacuated tube solar collectors, please contact:



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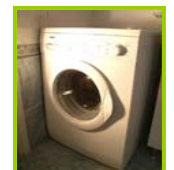
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Solar Water Heating

Good for Your Home, Your Business and the Environment

A solar hot water heating system supplements a conventional heating system. Solar water heaters reduce the cost of running conventional residential hot water tanks and commercial and industrial boilers by pre-heating the water that enters these systems.

Solar hot water systems can save the home owner or business a substantial amount of money and reduce GHG emissions. At current energy prices, these systems can pay for themselves in 5-10 years, depending on the application. If fuel prices continue to rise, the payback time reduces.

Benefits

- **Reduce Operational Costs**
- **Reduce Air Pollution**
- **Offset Greenhouse Gases**
- **Utilize Renewable Resource**

Ask us about **Incentives and Grants** available in your area.

Advantages of Evacuated Tube Technology over Flat Plate Collectors

Easier Installation - One person can quickly and easily install a SUNDA collector without a hoist or special tools because the vacuum tubes, manifold, and frame are installed separately. This unique feature results in substantial savings in installation time and expense. This is not possible with most flat plate products because of their one-piece construction.

Superior Insulation - As any good thermos bottle proves, there is no better insulator to heat transfer than a vacuum. SUNDA's glass tubes are evacuated to 10^{-5} mbar, which provides excellent resistance to heat losses via conduction and convection, even under extreme environmental conditions like cold winter temperatures and wind. Flat plate collectors lose a considerable part of the heat energy collected back to the environment.

Easier Servicing - Since the evacuated tubes are installed in the manifold via dry connections, any tube can be replaced without shutting the system down. Flat plate systems must be shut down and drained.



Longer Life - High vacuum protects the absorber surface from moisture, condensation, corrosion, and degradation of the selective coating over the entire life of the collector, which easily exceeds 15 years. Flat plate collectors are not immune to these effects since air contacts the absorber and all interior surfaces.

Better Efficiency - Vacuum technology insures a high year round efficiency. Flat plate collectors are less efficient during cold seasons.

Dual Use Potential - Domestic water and space heating are possible.

Better Conversion Threshold - More energy is collected earlier in the day and during partly cloudy days because of the special absorber coating and superior insulation.

An optimally sized SUNDA system can provide from 65% to 70% of a typical household's hot water needs, and up to 100% during the summer.

A business can save 40% to 80% on electric or fuel bills by replacing its conventional water heater with a solar heating system.

(source: Solar Energy Industries Association, www.seia.org)