

FreeFuelForever.com

Solar Water Heaters

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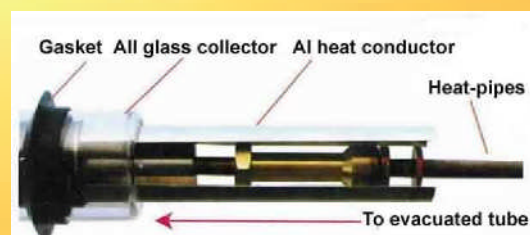
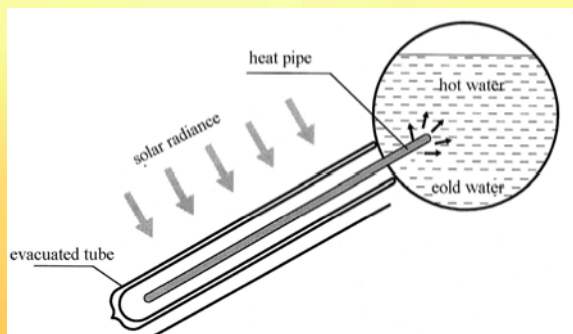
Premium Model Copper Heat Pipe Solar Water Heaters

- No circulator pump, electricity or controls required
- **Assemble yourself and use in 3 hours**
- Fast start-up, small heat capacity heat pipe
- Freeze proof, no water in tube
- Failure tolerant-no water leak if tube breaks
- Efficient-quasi tracking of sun over day
- Flexible-large systems use units in series
- Optional electronic controller-heater
- **Pressurized**



Copper Heat Pipe-Premium High Pressure Model	
Volume of storage tank	158 liter, 178 liter, 208 liter
Tube Type 1.5 m Ø 47 mm	Aluminum fin, Copper heat pipe, removable, Tr=0.91
Number of tubes	21 (158 liter), 24 (178 liter), 28 (208 liter)
Water tank (inner)	304 Stainless Steel, 1.5 mm thick
Water tank (outer cover)	Stainless Steel (older style was Al-Zinc plate)
Insulation	Polyurethane foam, thickness 45 mm
Reflector	Flat plate diffuse, aluminum, 5% efficiency increase
Frame	Profile Aluminum, 45 (or 30) degree angle
Working pressure	0.45 MPa=65 psi
Aperture area, m ²	2.02 m ² , 2.33 m ² , 2.77 m ²
Absorber Coating	Selective, sputtered graded Al/N-Al, absorbance (AM1.5)=0.9, emittance=0.08 @ 80 C, Heat loss coefficient=0.80 W/m ² K
Heat loss coefficient	9.5 W/m ² ·K (entire collector)
Inlet/outlet connections	1/2"
Shipping	80 kg, 8ft X 4ft pallet (3.5 ft height)

The premium copper-heat pipe model is pressurized, has higher efficiency per tube, is faster starting in low light conditions and takes the smallest area of roof space.



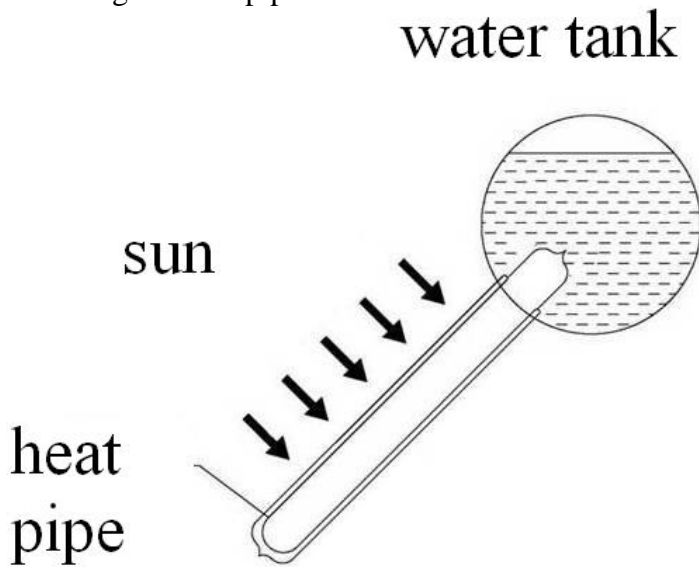
Glass Heat Pipe Solar Water Heaters

- No circulator pump, electricity or controls required
- No pressure, gravity feed, float filler mechanism
- **Assemble yourself and use in 3 hours**
- Freeze proof, no water in tube
- Failure tolerant-no water leak if tube breaks
- Efficient-quasi tracking of sun over day
- Flexible-large systems use units in series
- Optional electronic controller-heater



	Glass Heat Pipe
Volume of storage tank	170 L
Tube Type 1.5 m Ø 47 mm	One piece all-glass heat pipe Transmittance of cover tube=0.91
Number of tubes	27
Water tank (inner)	Stainless Steel
Water tank (outer cover)	Aluminum/zinc coated steel sheet
Insulation	Polyurethane foam, thickness 45 mm
Reflector	Flat plate diffuse, aluminum, 5% efficiency increase
Frame	Profile Aluminum, 45 degree angle
Working pressure	Vented to atmosphere, gravity feed
Aperture area, m ²	2.7
Absorber Coating	Selective, sputtered graded Al/N-Al, absorbance (AM1.5)=0.9, emittance=0.08 @ 80 C, Heat loss coefficient=0.80 W/m ² K
Heat loss coefficient	9.5 W/m ² K (entire collector)
Inlet/outlet connections	1/2"
Shipping	80 kg, 8ft X 4ft pallet (3.5 ft height)

The all-glass heat pipe model can stand corrosive water.



U-Tube Solar Collector

- High efficiency; independently tested
- Modular system-easy handling.
- Lies flat on roofs, balconies.
- Highest pressure system, up to 0.6 MPa
- Failure tolerant-no water leak if tube breaks
- Efficient-quasi tracking of sun over day
- Flexible-large systems use units in series



SPECIFICATIONS		
MODEL	SLU-1500/12	
Tube	1.5 m Ø 47 mm	
Number of tubes	12	
U Tube	material	copper
	diameter, mm	8 mm
	thickness, mm	1 mm
Aperture area, m ²	1.09 m ²	
Efficiency (η)	0.616	
Heat loss (a ₁)	1.293 W/(m ² K)	
Net weight	30 kg on roof	
Reflector	Flat plate diffuse	
Working Pressure	0.6 MPa=87 psi= 6 atmospheres	
Inlet/outlet connections	1/2" 3/4"	
Stagnation temp.(with reflector)	220 C	
Shipping weight	45 kg, 4ft X 8ft pallet, 10 inch height	

Operational Principle

Tubes work at any angle, any configuration. Rated to highest water pressure of any collector. Works with thermo siphon or indirect, split systems-maximum flexibility for remote tanks.



Water-in-Tube Solar Collector

- Swimming Pool Solar Heating
- Apartment buildings, factories
- Efficient, simple, large 5 m² area.
- Use in all latitudes
- Quasi-tracking of seasons
- Low pressure- less than 0.1 MPa
- Large water volumes, low cost



Item	SLL-1200/50
Collector tubes	1.2 m long, 47 mm diameter, Evacuated,
Tubes	50 pieces, horizontal.
Manifold material, stainless steel, thickness	Stainless steel SUS304, 0.8 mm or SUS3 16L only for heating swimming pool (special order)
Insulation material, thickness	Polyurethane, 45 mm
O-ring material	Silicon rubber
Operating pressure	Un pressurized, maximum 0.1 MPa=14.7 psi
Reflector	Flat plate diffuse
Aperture Area	5 m ²
Outer size	2 m by 2.5 m by 14 cm
Net weight	75 kg
Inlet/outlet connections	1" (2.54 cm) diameter

There are two secrets to the efficiency of evacuated solar tubes: the high technology coating absorbs nearly all of the sun's energy, and the vacuum between the absorber and the outside air means that no heat can escape by conduction or convection. The cylindrical absorber of the tube tracks the sun across the sky. Low heat loss and high efficiency give maximum hot water, practically Free Fuel, Forever.

Prices: www.freefuelforever.com

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