

Solar Thermal Collectors, Components and Materials

	Solar Collectors	High Performance Solar Thermal Collectors SRCC OG100 Approved SRCC OG300 Approved Commercial, Industrial and Residential
	Engineered Systems	Pre-Engineered Light Commercial and Residential Systems Racking & Mounting Hardware, Tank(s), Pump Stations with Controller and Expansion Tank, Air Vents, Fittings and Instruction Manual
	Pump Stations & Controllers	Available from 3/4" and larger heavy-duty commercial stations integrates all the major functional and safety components into one compact, pre-assembled, high-quality unit. Smart controllers with speed control, measurement and logging.
	Solar Tanks	Pressurized tanks 79-264 gallons, Single Coil, Dual Coil and Storage Non-pressurized tanks from 120-5,000 gallons and up including stainless steel and Pre-Cast Cement. Heat exchangers, expansion and drainback tanks
	Hoses & Connectors	Helical corrugated tube for solar thermal system is approved by IAPMO and UL Solar hot water collector system between collector and Solar hot water storage tank Assembly at site is very simple with heat-resistant 662°F thread-assembly fitting
	Fittings & Valves	By-pass, ball and check valves Mixing, tempering valves and air vents Adapters, connectors, nipples, plugs, couplings, and unions
	Monitoring Systems	System performance graphics show daily, weekly, annual performance metrics Residential & Commercial applications Mobile and iPhone apps allow you to check your system from anywhere!
	Digital Flow Meters	Grundfos Digital Flow meters feature combined flow and temperature sensors Designed for high-volume production and compatible with wet, aggressive media. Available size from 1/2" to 1" Available flow from .2 - 53 GPM
	Ultrasonic Flow Meters	Wall Mounted and Hand Held Ultrasonic Flow Meters and Transducers Based on transit-time flow measurement principle. It measures flow rate of liquid in a closed pipe by using a pair of clamp-on or wetted ultrasonic transducers
	Glycol Charging	Glycol Charging Unit Flush, fill in heat transfer medium and vent solar loops in just one pass Compact, easy to use, all in one system
	Glycol 5 gallon Tote	An inhibited propylene glycol designed for hydronic systems High quality anti-freeze protection fluid, non-toxic and bio degradable Available in 5 gallon totes at 50% solution
	Roof Penetration	Can fit up to two 1" pre-insulated hoses Great for PV and Thermal installations Works on pitched roof and side building mounting
	Materials	Anaerobic adhesives, anti-sieze, contact & elastic adhesives Epoxies, lubricants, technical liquids & sprays Make sure the job is right and guarantee your work
	Hydronic Components	Pumps, check valves, gauges, controls and thermostats Distributor, manifolds, headers and switcher Mounting hardware
	Pool Collectors	Swimming pool collectors and connection kits Pool controllers and system connection kits Heat exchangers
	Engineering	Engineering and design services for solar hot water applications Complete services, including material selection, engineering analysis, thermal management consideration, and blueprints

Free Hot Water

Convert sunshine into Free Hot Water to cut your utility bills and let your roof save you money every day. More and more people want to reduce their environmental impact, while reducing their utility bills. Solar hot water is an easy and economical way to do both. Solar water heating is a clean, environmentally friendly and affordable source of energy. It is renewable, and there are no toxic emissions. As the shift towards a low-carbon energy sector steadily gathers momentum, a transformation of the entire market is occurring.

Growing concerns over energy supplies, fossil fuel price volatility and climate change are accelerating this transformation. Policy makers are finally realizing that solar thermal energy has an enormous impact. By tapping into the renewable power of the sun to heat water, businesses can cut operating costs and reduce their environmental impact. The energy savings potential is even greater for businesses that use a lot of hot water such as: apartments, restaurants, hotels, universities, and other hot-water-intensive sectors.

Solar Water Heating is a Great Way to Save Money and Show Environmental Responsibility
30% Tax Credit - State Incentives - State and Utility Rebates - Increase Resale Value without Increase in Property Taxes
Accelerated Depreciation (MARCS) - Loan Interest Deductions - Enjoy the Promotional Benefits as a "Green" Business
Reduce Operating Costs - Increase the Bottom Line - Hedge against Rising Energy Costs - Reduce Your Impact on the Environment

Free Hot Water engineers design custom systems for each unique application: apartment buildings, hotels, hospitals, laundry facilities, car washes, and municipal applications. We pride ourselves on assessing the project, and designing a system that will optimize hot water production and flow while dramatically reducing energy bills. Design services include material selection, engineering analysis, thermal consideration and blueprints. At Free Hot Water we use state of the art engineering software along with internally developed tools that allow us to electronically "build" the product to its final design, allowing our customer to review project details before actual construction takes place.

Free Hot Water works with a network of distributors, independent dealers and installers to support Commercial, Residential and Municipal customers with purchasing decisions and installations. We are always looking for dealers and experienced plumbing, mechanical, and building contractors who want to build their new or existing business enterprise in the solar hot water industry. As a Certified Dealer you will have access to our large selection of collectors, materials and systems components, leads and marketing support.

One of the most cost-effective ways to include renewable energy technologies into a building is incorporating a solar hot water system. The Free Hot Water Solar System can eliminate up to 80% of your annual hot water heating energy needs, substantially reducing your gas or electric bill and the associated environmental impact.

In the summer, a Free Hot Water Solar System can provide 100% of your hot water needs. In the winter, solar energy saves energy by pre-heating water to a level that requires much less conventional energy, conserving energy use by an average of up to 80% annually, prolonging the life of your water heater and reducing CO2 emissions.

Installing one of our high efficiency Free Hot Water Solar Systems is one of the most significant personal actions you can take to cut air pollution and greenhouse gas emissions, while helping to conserve precious energy resources for future generations. Plus, solar energy reduces the need for costly new power plants.

Visit us on the web at: www.FreeHotWater.com



Over 1,200 Solar Thermal Items Available!
Shop On-Line at: <http://shop.freehotwater.com/>
 Solar Hot Water Collectors, Components, Pre-engineered systems, Solar Storage Tanks, Heat Exchangers, Circulator Pumps, Controllers, Pump Stations, Pre-insulated Flex Hose, Radiant Heat Components, Tools, Sealants, Adhesives and more

Engineering Design Tools and Calculators
<http://www.freehotwater.com/calculator.html>
 Commercial & Residential Solar Hot Water Calculator; Commercial Collector Spacing Calculator; Swimming Pool Calculator; Glycol Mix Calculator; Radiant Floor and Heat Loss Calculator; Carbon Dioxide Emissions Calculator; Annual Insolation U.S.; Roof Azimuth Measurement Tool; Compound Angle Tool; Latitude/Longitude Time Zone Calculator



Blog with Solar Fred
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 Follow Solar Fred as he explores Solar Thermal around the world. From solar water heating reports and case studies to solar marketing tips for Twitter and Facebook.

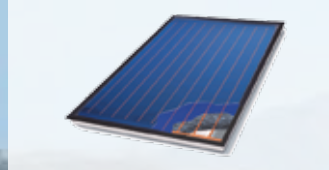


Certified Solar Thermal Collectors



FHW 7000 SERIES

High Performance Thermal Collector
Intelligent Design
Deep Drawn Aluminum Tray
Highly Selective Absorbent Coating
2" Thermal Insulation 40/50 Rockwool
Tempered Low Iron Glass
Suitable for Closed Loop Systems
In Roof, Pitched and Flat Roof Installation
Dimensions - 81.6" X 48" X 3.6"
Thermal Output - 1.66 Kw per hour
Max Stagnation (f) 453 Max PSI-145
Absorber Capacity 43
Manifold 3/4" - Risers 3/8"
Free Hot Water Item #: FHWFC-70275
Gross Area: 2.571 m², 27.67 sf
Net Aperture: 2.34 m², 25.14 sf
Weight - 108 Lbs
10 Year Limited Warranty
Approvals - SRCC OG 100
SRCC Clear Day Daily BTUs - 28,400



FHW 5000 SERIES

High Performance Thermal Collector
Intelligent Design
Deep Drawn Aluminum Tray
Selective Absorbent Coating
Thermal Insulation Rockwool
Tempered Low Iron Glass
Suitable for Closed & Open Loop Systems
Pitched and Flat Roof Installation
Dimensions - 79.5" X 40" X 3"
Thermal Output - 1.35 Kw per hour
Max Stagnation (f) 410 Max PSI-116
Absorber Capacity 1.1 gal.
Manifold 3/4" - Risers 3/8"
Free Hot Water item #: FHWFC-50221
Gross Area: 2.070 m², 22.28 sf
Net Aperture: 1.85 m², 19.91 sf
Weight - 84 Lbs
10 Year Limited Warranty
Approvals - SRCC OG 100
SRCC Clear Day Daily BTUs - 23,100



FHW 4000 SERIES

High Performance Thermal Collector
Optimal Value for the Money
Aluminum Frame
PVD Selective Coating
Thermal Insulation - Polyurethane Foam
Tempered Solar Safety Glass
Suitable for Closed & Open Loop Systems
Pitched and Flat Roof Installation
Dimensions - 76.5" X 41" X 3"
Thermal Output - 1.26 Kw per hour
Max Stagnation (f) 453 Max PSI-145
Absorber Capacity 60 gal.
Manifold 3/4" - Risers 1/2"
Free Hot Water Item #: FHWFC-40220
Gross Area: 3.611 m², 38.87 sf
Net Aperture: 3.48 m², 37.44 sf
Weight - 132 Lbs
10 Year Limited Warranty
Approvals - SRCC OG 100
SRCC Clear Day Daily BTUs - 21,500



FHW 8000 SERIES

High Performance Thermal Collector
Glazed Flat Panel Large
Aluminum Extrusion
Selective Black Chrome on Nickel
Insulation - 1-3/16" Polyisocyanurate
Low Iron Tempered Glass
Suitable for Closed & Open Loop Systems
Pitched and Flat Roof Installation
Dimensions - 120" X 48" X 4"
Thermal Output - 2.48 Kw per hour
Absorber Capacity .7 gal
Manifold 1" - Risers 1/2"
Free Hot Water Item #: FHWFC-80400
Gross Area: 3.611 m², 38.87 sf
Net Aperture: 3.48 m², 37.44 sf
Weight - 132 Lbs
10 Year Limited Warranty
Approvals - SRCC OG 100
SRCC Clear Day Daily BTUs - 42,400

Solar Hot Water Storage Tanks (Pressurized and Non-Pressurized)

Single & Dual Coil Pressurized Storage

Description	79 gal	105 gal	132 gal	211 gal	264 gal
Height	A 47.64"	61.42"	73.23"	77.17"	82.28"
Diameter	B 29.13"	29.13"	29.13"	39.37"	41.34"
Circuit Inlet	C 3.35"	3.35"	3.35"	4.92"	7.48"
Serpentine	D 11.02"	11.02"	11.02"	13.78"	16.54"
Sensor Case	E 21.85"	23.82"	25.59"	40.75"	43.70"
Serpentine	F 26.97"	30.71"	34.45"	49.21"	52.95"
Service Circulation	G 34.45"	48.23"	60.04"	60.04"	63.39"
Hot Water Outlet	H 44.69"	58.66"	70.28"	74.41"	78.15"
Cleaning Door	DN100	DN100	DN100	DN250	DN250
Serpentine In/Out Dia.	1"	1"	1"	1"	1"
Circuit In Hot Outlet	1"	1"	1"	1"	1"
Service Circulation	3/4"	3/4"	3/4"	3/4"	3/4"
Weight (lbs) Single	240	392	444	574	649
Weight (lbs) Dual Coil	256	418	480	607	678
Tank Wall Thickness	3.0mm	3.0mm	3.0mm	4.0mm	4.0mm

Tank - Steel 6837, DIN EN 10120, P245NB - Double Enameling 1580 degrees - Supplied with a Mg anode, Anti-corrosive protection Flange for easy interior cleaning - Serpentine Coil - Steel plate ST 37.2 Coating: Enamel (vitrified steel) - Insulation CFC free (105-211 gal.) Polyurethane density: 40 kg/m³ - Thickness: 2" Insulation foam (211-264 gal.) - Working pressure 116 psi Maximum 174 psi Maximum temperature 185° F

Non-Pressurized Storage Solutions
Water can be circulated in a closed loop through the tank heat exchanger, or tank water can be circulated open loop. Both methods in the same tank is also possible. Long Life Pre-cast Concrete Underground Storage Tanks - Insulation 4" polyisocyanurate foam, all sides (approx. R-25) Insulation waterproofing .045" EPDM rubber Easy Installation Collapsible Solar Storage Tanks A packaged, fully manufactured, light weight tank fits through most doorways. Heat Exchanges are custom made for variable tank temperature heating applications.

Complete Pre-Engineered Systems

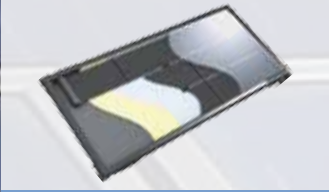
2 to 60 Collector Systems Ready To Ship!

Collector Series 4000 Systems					Collector Series 5000 Systems					Collector Series 7000 Systems					Collector Series 8000 Systems						
#	GPD*	Storage	Pipe	GPM*	#	GPD*	Storage	Pipe	GPM*	#	GPD*	Storage	Pipe	GPM*	#	GPD*	Storage	Pipe	GPM*		
2	90	79	.75"	1.0	2	100	79	.75"	1.0	2	125	79	.75"	1.0	2	175	79	.75"	1.4		
3	130	105	.75"	1.5	3	140	105	.75"	1.5	3	180	132	.75"	1.5	3	250	132	.75"	2.1		
6	250	211	.75"	3.0	6	275	211	.75"	3.0	6	325	264	.75"	3.0	6	500	211	.75"	4.2		
9	350	264	.75"	4.5	9	400	264	.75"	4.5	9	750	2x211	.75"	4.5	9	725	2x211	1.00"	6.3		
12	475	2x211	1.00"	6.0	12	525	2x211	1.00"	6.0	12	650	2x211	1.00"	6.0	12	975	2x211	1.00"	8.4		
15	600	2x211	1.00"	7.5	15	650	2x211	1.00"	7.5	15	800	2x264	1.00"	7.5	15	1200	2x264	738	1.25"	10.5	
18	700	2x264	1.00"	8.8	18	785	2x264	1.00"	9.0	18	950	2x264	1.00"	9.0	18	1425	3x211	822	1.25"	12.6	
21	850	2x264	1.25"	9.0	21	900	2x264	1.25"	10.5	21	1125	3x211	738	1.25"	21	1675	3x264	957	1.25"	14.7	
24	950	3x211	738	1.25"	10.5	24	1025	3x211	738	1.25"	24	1275	3x264	822	1.25"	24	1900	4x264	957	1.50"	16.8
27	1075	3x211	822	1.25"	12.0	27	1160	3x211	822	1.25"	27	1425	3x264	957	1.25"	30	2150	4x264	1205	1.50"	18.9
30	1175	3x264	957	1.25"	13.5	30	1275	3x264	957	1.25"	30	1575	4x211	957	1.25"	30	2375	5x264	1205	1.50"	21.0
33	1300	3x264	957	1.25"	15.0	33	1425	3x264	957	1.25"	33	1750	4x264	1205	1.25"	33	2600	5x264	1550	2.00"	23.1
36	1425	4x211	1205	1.50"	16.5	36	1550	4x211	1205	1.50"	36	1900	4x264	1205	1.50"	36	2850	6x264	1550	2.00"	25.2
42	1650	4x264	1205	1.50"	18.0	42	1800	4x264	1205	1.50"	42	2225	5x264	1550	1.50"	42	3300	7x264	1900	2.00"	29.5
48	1900	5x264	1550	2.00"	24.0	48	2050	5x264	1550	2.00"	48	2525	6x264	1550	2.00"	48	3775	8x264	2500	2.00"	33.8
54	2150	5x264	1550	2.00"	27.1	54	2300	5x264	1550	2.00"	54	2850	6x264	1900	2.00"	54	4250	9x264	3500	2.00"	38.0
60	2375	6x264	1900	2.00"	29.9	60	2575	6x264	1900	2.00"	60	3150	7x264	2500	2.00"	60	4725	10x264	3500	2.00"	42.3

System include Solar Thermal Collectors, Racking and Mounting Hardware, Storage Options (Pressurized or Large Non-pressurized Tanks), Pump Stations engineered and sized specifically for your application with smart controller and expansion tank(s), air vents, expansion bands, and connection kits. Copper piping is not included. Pre-insulated flex hose, fittings and valves are available and sized per specification. Blueprints and engineering services available.

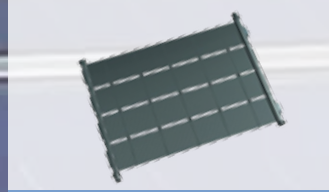
(Number of Collectors) *GPD (Gallons Per Day) Storage Tank (Pressurized and Non-pressurized options) Plumbing Pipe sized per flow specifications *GPM (Gallons Per Minute)

Pool Panels & Components



FHW POLY PANEL

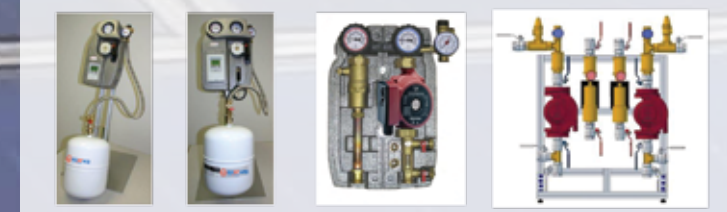
Durable, Lightweight,
Freeze-Resistant Solar Panel
Insulation - Polyurethane Foam
Overmolding Injection Manifold
Reinforced Composite and Aluminum
Multiwall Polycarbonate Glazing
UV Stabilized Polypropylene Back
Engineered Freeze Protection
Safety Overheat Mechanisms
Scale and Calcification-Free
Reduced Installation Time
Impact-Resistant Glazing
117 individual composite tubes
Manifold Connection 3/4"
Weight - 34 Lbs
Free Hot Water #: FHWFC1972340
10-Year Warranty
SRCC Testing in Process



FHW POOL PANELS

Unglazed Pool Collectors
Available in 4 Sizes:
4' x 8' (32 sf)
4' x 9.5' (38 sf)
4' x 10.5' (42 sf)
4' x 12.5' (50 sf)
Proprietary Polymer Formulation
UV Stabilized
Resistance to Extreme Weather,
Corrosion, Scale, Salts and Seawater
Attached Mounting Hardware
117 individual composite tubes
Manifold Connection 2"
Over-Molding Injection
Freeze-Resistant
Square Manifold Header
10-Year Warranty
SRCC Rating 2,000 BTUs per sq. ft.

Pump Stations & Controllers



Available from 3/4" and larger; heavy-duty commercial stations integrate all the major functional and safety components into one compact, pre-assembled, high-quality unit.



Smart controllers with speed control, measurement and logging

From 2 to 6 sensor inputs for Pt1000 temperature sensor
1 to 3 relay outputs for speed control of pumps and valves
2 relay output 230VAC for pumps/valves - 2 to 6 Temperature probes (Pt1000 Type)
Heat quantity measurement and logging (BTU or Kw per hour)

WEICON Specialty Materials and Products for Production, Repair and Maintenance

Plastic Metal	Repair Sticks	Construction Adhesives	Epoxy Adhesives
Anaerobic Adhesives	Contact Adhesives	One-Component	Technical Sprays
Technical Liquids	Anti-Seize	All Around Lubricants	Stripping Tools

Special adhesives and sealants, technical aerosols and high-performance assembly pastes and greases for all areas of production, repair, maintenance and servicing

Solar Thermal Accessories

Solar Thermal Heat Transfer Fluid Specifications for 50% concentration Boiling Point @760 mm Hg: 311°F Flush Point: 225F Auto Ignition Temperature: >700F Freezing Point: -70°F Specific Gravity: 1.06 Vapor pressure at 20°C: 0.1 mm Hg Color: Orange Odorless Vapor Density (air = 1): 2.1 Evaporation rate:(H2O=1) < 1 Solubility in Water: Complete Features Inhibited Propylene Glycol designed for Hydronic systems. High quality anti-freeze & anti corrosion protection fluid. Environmentally compatible, non-toxic & bio degradable. The Orange dye is useful for leak detection. Protects metal parts. Benefits Designed for solar thermal applications, line heaters, snow melting and refrigeration systems, combination of heating and cooling systems and thermal energy storage systems. Available in 5 Gallon Totes	Solar Thermal and PV Monitoring Compact Size (5.5" x 4" x 1.4") Easy to Install - Plug and Play One Unit Monitors Solar Thermal and PV Modular Sensor Design "ZERO Config" Setup (patent pending) Universal Interface for Solar Thermal and PV Includes 5 Years Support Residential 3 Temperature Inputs 2 A/C Load Inputs For Pump Status, re-heat coil status Pressure Switch Input Ethernet Connection Commercial 6 Temperature Sensors 2 Data Ports For Flow Meter(s) or CT Sensor(s) Pressure Sensor Input Static IP or DHCP	Helical Corrugated Flexible Tubes for Solar Thermal Systems Diameter Length (ft.) PSI 15A (1/2") 75' to 1000' 213 20A (3/4") 75' to 1000' 185 25A (1") 75' to 1000' 171 Fast and Easy Installation Solar hot water collector system to Copper Pipes or between collector and Solar hot water storage tank. ANSI 315L Assembly at site is very simple with heat-resistant 662°F thread assembly fitting. Approved by IAPMO and UL	Flat and Pitched Roof Solutions Kits include all mounting hardware. Racking available for multiple panels and multiple solar array assemblies IAPMO FREEHOTWATER SOLAR THERMAL SOLUTIONS
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