



SUN EARTH

THE EMPIRE SERIES

SOLAR COLLECTOR SPECIFICATION SHEET

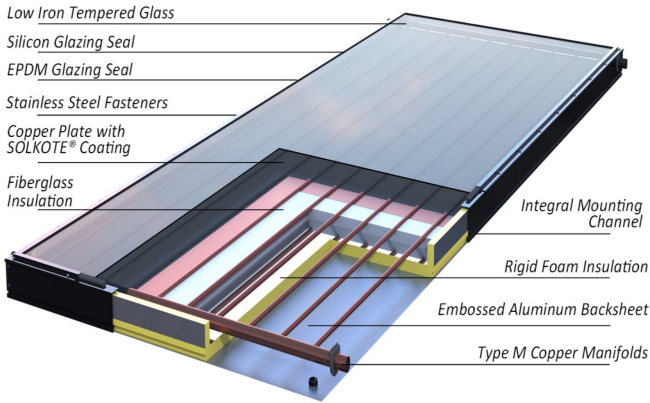
Applications



Solar Water Heating



Solar Pool Heating



Thermal Performance Ratings*

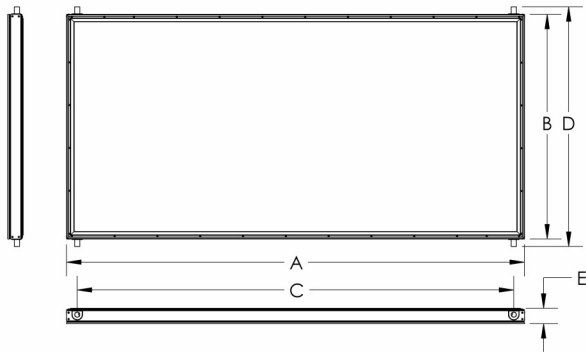
Category (Ti-Ta) <small>Ti=inlet fluid temp Ta=ambient temp</small>	BTU/ft ² *Day		
	Clear (2000)	Mildly Cloudy (1500)	Cloudy (1000)
A(-9°F)	1290	965	645
B(9°F)	1210	890	570
C(36°F)	1035	720	410
D(90°F)	600	315	70
E(144°F)	150	-	-

A-Pool Heating (Warm Climate) B-Pool Heating C-Water Heating (Warm Climate) D-Water Heating (Cool Climate) E-Air Conditioning/Industrial Process Heat. **Thermal performance is obtained by multiplying the collector output for the appropriate application and insolation level by the total gross collector area** *Collector ratings are derived from the Solar Rating & Certification Corp (SRCC) Document RM-1 and OG-100. Tested at water design flowrate.

Available Connections

- 1" Sweat (Standard)
- 1" High Temperature FKM SX Press
- 1" High Temperature FKM O-Ring Union

Dimensions



F = Fluid Capacity (gal.)
G = Gross Area (ft²)

AA = Aperture Area (ft²)
W = Dry Weight (lbs)

DF = Design Flow Rate (gpm)
ΔP = Pressure Drop at Design (psig)

MODEL	A(in)	B(in)	C(in)	D(in)	E(in)	F	G	AA	W	DF	ΔP
EP-40	122.2	48.2	115.63	51.38	3.25	1.20	40.9	37.2	141	1.20	0.009
EP-32	98.2	48.2	93.63	51.38	3.25	1.00	32.8	29.7	106	0.97	0.006
EP-24	98.2	36.2	93.63	39.38	3.25	0.78	24.7	21.9	80	0.73	0.005

Materials

- Absorber Coating: SOLKOTE®
- Absorbivity/Emissivity: 94%/56%
- Absorber Plate: Copper
- Header Size: 3/4" and 1" Nominal Copper (1.125"/0.875" OD)
- Riser Size: 3/8" Nominal Copper (0.50" OD)
- Glazing: Low Iron Prismatic/Matt Tempered Glass
- Glazing/Header Seal: EPDM
- Frame: AA 6063-T6 Bronze Anodized Aluminum
- Backing Plate: AA3105-H26 Painted Embossed Aluminum
- Insulation: Polyisocyanurate and Fiberglass R≥12

Design Limits

- Max Operating Pressure: 160psi
- Max Wind/Snow Load: ±90psf
- Max Operating Temperature: 300°F
- Max Flow Rate: 12gpm

Due to SunEarth's policy of continuous product improvement, specifications are subject to change without notice.



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MODEL	A(in)	B(in)	C(in)	D(in)	E(in)	F	G	AA	W	DF	ΔP
EP-21	76.2	40.2	71.63	43.38	3.25	0.72	21.8	18.8	70	0.62	0.003
EP-40-0.75	122.2	48.2	115.63	51.38	3.25	1.03	40.9	37.2	141	1.20	0.009
EP-32-0.75	98.2	48.2	93.63	51.38	3.25	0.83	32.8	29.7	106	0.97	0.006
EP-24-0.75	98.2	36.2	93.63	39.38	3.25	0.65	24.7	21.9	80	0.73	0.005

ENGINEERING SPECIFICATIONS

(Performance specifications subject to testing error of +/- 3%)

The following shall be the specifications for the solar collectors. Collectors shall be SunEarth Empire model _____, and shall be of the glazed liquid flat plate type. Collectors shall be tested in conformance with ASHRAE 93-2003 and Solar Rating and Certification Corporation (SRCC)100-10, ISO 9806-1 & 9806-2 and have their thermal performance rated according to SRCC Document RM-1. The collectors shall be certified by SRCC and listed by the International Association of Plumbing and Mechanical Officials (IAPMO).

GENERAL:

The dimensions of the collector shall be _____ inches in length, _____ inches in width and 3.25 inches in depth. The collector casing shall be an anodized aluminum extrusion (alloy 6063 T6), minimum thickness 0.060 inch, with an architectural dark bronze finish. The casing shall have notched framewalls for ease of plate removal and reinstallation. Sheet metal screwed fasteners shall be stainless steel (18-8 #10). The backsheet shall be painted textured aluminum not less than 0.014 inch thickness. A 1 inch vent plug shall be installed in each of the four corners of the backsheet to minimize condensation. An integral mounting channel shall allow the solar collector to be mounted without penetration of the extruded aluminum casing.

GLAZING:

The collector glazing shall be one sheet of low iron tempered glass, with a minimum of 0.125 inch thickness (0.15625 inch on EP-40, EP-40-0.75), and a minimum transmissivity of 91 percent (89 on EP-40, EP-40-0.75). The glazing shall be thermally isolated from the casing by a continuous EPDM gasket. There shall be a continuous secondary silicone seal between the glass and casing capstrip to minimize moisture from entering the casing.

INSULATION:

The insulation shall be foil-faced polyisocyanurate foam sheathing board of a minimum 1 inch thickness, siliconed in place to the aluminum backsheet, covered by low-binder fiberglass of a minimum 1 inch thickness, providing thermal isolation of the foam from the absorber plate. Total thermal resistance shall be a minimum of R-12. The sides and ends of the collector shall be insulated with a minimum of 1 inch foil-faced polyisocyanurate foam sheathing board.

ABSORBER PLATE AND PIPING:

The absorber shall consist of a roll-formed copper plate of no less than 0.008 inch thickness. Risers shall be a minimum of 0.50 inch O.D. Type M copper tubing on no more than 4.56 inch centers continuously soldered to the plate utilizing a non-corrosive solder paste with a melting point of 460°F. The risers shall be brazed to 1.125" O.D. Type M copper manifolds (0.875" O.D. Type L on EP-24-0.75, EP-32-0.75 and EP-40-0.75) utilizing a copper phosphorous brazing alloy with no less than a minimum 5 percent silver content, and conforming to the American Welding Society's BCuP-3 classification. EPDM grommets shall isolate the manifold from the aluminum casing. The absorber plate shall be designed for 160 psi maximum operating pressure and 300°F maximum operating temperature.

ABSORBER COATING AND PERFORMANCE CURVE:

The absorber coating shall be a moderately-selective black paint with a minimum absorptivity of 94 percent and a maximum emissivity of 56 percent. The instantaneous efficiency of the collector shall have a minimum Y-intercept of 0.726 and a slope of no less than -0.910 BTU/ft².hr.°F.

Note: Please refer to the SRCC website at www.solar-rating.org for the actual y-intercept and slope for each collector model.

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