5 Reasons for the Best Gobi Collectors

Performance Comparison

Heliodyne Gobi Collectors are the perfect match to any system specification, whether for small scale residential applications or large commercial installations. Since 1976 we have developed a strong and stable background in the industry. With our experience, we have developed certified packaged systems, with the best flat plate collector, the Gobi, that are simple to install for anywhere in the world. This comparison shows five reasons for choosing Gobi Collectors over other flat plate or evacuated tube collectors.

1. *Delta T*. The Solar Rating and Certification Corporation (SRCC)* currently rates solar collectors in five categories according to the difference between collector inlet fluid temperature (Ti) and the ambient temperature (Ta). Therefore, you want a collector which has the best performance in the temperature range of water you are trying to heat.

CATEGORY (Ti - Ta)			HEATING APPLICATION
A	-5°C	(-9°F)	Pool heating in a warm climate
B	5°C	(9°F)	Pool heating in a cool climate
C	20°C	(36°F)	Water heating in a warm climate
D	50°C	(90°F)	Water heating in a cool climate
E	80°C	(144°F)	Industrial process water heating

For example, if you have a pool in a warm climate, it makes sense to use the unglazed plastic pool panels, if you plan to use the facility in the summer months only. For year-round performance, use a Gobi system since the unglazed collector will have too large of a loss coefficient to produce in the other months.

Secondly, if you plan to heat water for domestic use in a warm or a cool climate, use Gobi Collectors, because they perform the best at this temperature range.

Gobi collectors also outperform many other collectors in the high delta T range. For higher temperature ranges (160°F and up), use a combination of Gobi Collectors and evacuated tubes for best overall performance.

2. *Efficiency*. All the SRCC data is calculated from efficiency equations acquired from testing collectors at certified test laboratories. A common error is to assume evacuated tube collectors perform much higher because of their 'high efficiency' on cloudy days. But, what is efficiency anyway? Efficiency is defined as:

$$\eta = \frac{\textit{What you get out.}}{\textit{What you put in.}}$$

With the use of this equation, it is easy to see that output will be low, no matter what your efficiency is, if you have a low input to start with. So, in the colder months of December and January when the sun is low, or when it is foggy; the evacuated tubes have their highest efficiency. In the other months, where there are warmer temperatures, more solar radiation available, the Gobi Collectors outperform evacuated tubes.

The SRCC has rated the Gobi 410, at a ΔT of 36°F with clear sky radiation, at 46,000 Btu / day, or 13.48 kWh / day. An evacuated tube with similar surface area is rated at a lower 40,000 Btu / day (11.72 kWh / day).

3. *Annual Performance*. The Gobi thermal systems outperform evacuated tubes in a warm and cold climate. The SRCC calculates annual system performance for all of its OG-300 certified systems in different cities around the nation. Energy savings from Seattle, WA and Philadelphia, PA between a Heliodyne and an evacuated tube system, are shown below.

System	Surface Area	Energy Savings (kWhr)	
		Philadelphia	Seattle
Helio-Pak 16 1410 G 80 AC	3.7 m^2 (40.3 ft^2)	1,900	2,200
Evacuated Tube System	4.6 m^2 (49.3 ft^2)	1,800	2,100

The table shows, even with a smaller surface area (18.3% less), the Heliodyne system STILL outperforms an evacuated tube system in both climates by at least 4.5%.

4. *Snow country*. Because of the low loss coefficient of the evacuated tubes, their performance can be drastically reduced in snow country because of ice formation on the tubes. When ice has formed on a Gobi Collector, with a loss coefficient that is not as small, a thin film of water forms between the collector solar glass and the ice. The water barrier makes it possible for the ice or snow to slide off the collector and begin producing hot water once again, while the evacuated tube receives little or no solar radiation.

5. *Cost.* The manufacturing techniques and material selection of evacuated tube collectors make them significantly more expensive than outperforming Heliodyne Helio-Pak systems with Gobi Collectors. Heliodyne systems optimize energy output per dollar spent, which means a lower invested first system cost, and a shorter overall payback period.

all SRCC data from www.solar-rating.org

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Gobi Solar Collectors

*Solar Rating and Certification Corporation Certified Performance Data**

COLLECTOR THERMAL PERFORMANCE RATINGS*

Btu per Gobi 410 per Day			
CATEGORY (Ti-Ta) Ti = inlet fluid temp Ta = ambient air temp	CLEAR DAY 2000 Btu / ft²·Day	MILDLY CLOUDY DAY 1500 Btu / ft²·Day	CLOUDY DAY 1000 Btu / ft²·Day
A (-9°F)	58,000	49,000	29,000
B (9°F)	53,000	40,000	26,000
C (36°F)	46,000	31,000	18,000
D (90°F)	28,000	16,000	5,000
E (144°F)			

kWh per Gobi 410 per Day			
CATEGORY (Ti-Ta) Ti = inlet fluid temp Ta = ambient air temp	CLEAR DAY 6.39 kWh / m²·Day	MILDLY CLOUDY DAY 4.72 kWh / m²·Day	CLOUDY DAY 3.06 kWh / m²·Day
A (-5°C)	17.00	14.36	8.50
B (5°C)	15.53	11.72	7.62
C (20°C)	13.48	9.09	5.28
D (50°C)	8.21	4.69	1.47
E (80°C)			

Btu per Gobi 408 per Day			
CATEGORY (Ti-Ta) Ti = inlet fluid temp Ta = ambient air temp	CLEAR DAY 2000 Btu / ft²·Day	MILDLY CLOUDY DAY 1500 Btu / ft²·Day	CLOUDY DAY 1000 Btu / ft²·Day
A (-9°F)	46,000	37,000	25,000
B (9°F)	43,000	33,000	21,000
C (36°F)	37,000	27,000	15,000
D (90°F)	23,000	14,000	4,000
E (144°F)	10,000	2,000	

kWh per Gobi 408 per Day			
CATEGORY (Ti-Ta) Ti = inlet fluid temp Ta = ambient air temp	CLEAR DAY 6.39 kWh / m²·Day	MILDLY CLOUDY DAY 4.72 kWh / m²·Day	CLOUDY DAY 3.06 kWh / m²·Day
A (-5°C)	13.48	10.84	7.33
B (5°C)	12.60	9.67	6.15
C (20°C)	10.84	7.91	4.40
D (50°C)	6.74	4.10	1.17
E (80°C)	2.93	0.59	

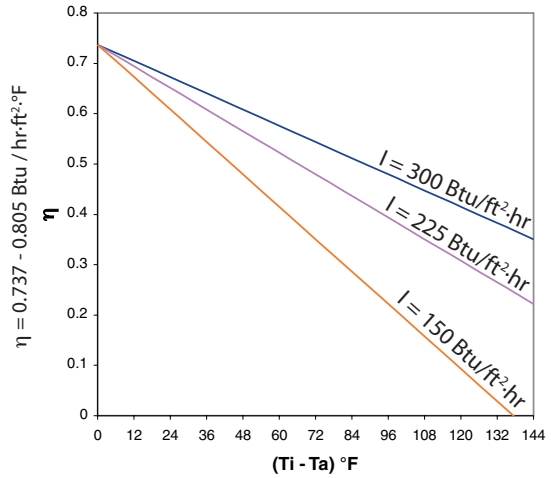
Btu per Gobi 3366 per Day			
CATEGORY (Ti-Ta) Ti = inlet fluid temp Ta = ambient air temp	CLEAR DAY 2000 Btu / ft²·Day	MILDLY CLOUDY DAY 1500 Btu / ft²·Day	CLOUDY DAY 1000 Btu / ft²·Day
A (-9°F)	38,000	29,000	20,000
B (9°F)	35,000	26,000	17,000
C (36°F)	30,000	21,000	12,000
D (90°F)	18,000	10,000	3,000
E (144°F)	7,000	1,000	

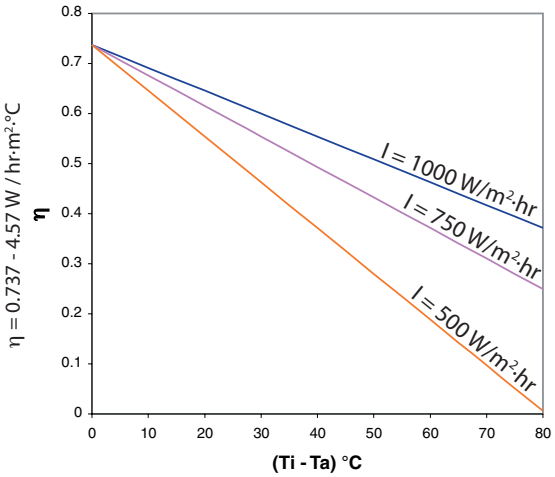
kWh per Gobi 3366 per Day			
CATEGORY (Ti-Ta) Ti = inlet fluid temp Ta = ambient air temp	CLEAR DAY 6.39 kWh / m²·Day	MILDLY CLOUDY DAY 4.72 kWh / m²·Day	CLOUDY DAY 3.06 kWh / m²·Day
A (-5°C)	11.14	8.50	5.86
B (5°C)	10.26	7.62	4.98
C (20°C)	8.79	6.15	3.52
D (50°C)	5.28	2.93	0.88
E (80°C)	2.05	0.29	

A - Pool Heating (Warm Climate) **B** - Pool Heating (Cool Climate) **C** - Water Heating (Warm Climate) **D** - Water Heating (Cool Climate) **E** - Air Conditioning

*Gobi performance ratings are derived from the Solar Rating & Certification Corporation (SRCC) Document RM-1 and Standard OG-300 - www.solar-rating.org

Gobi Collector SRCC Certified Efficiency Plot





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