OG-100 Solar Thermal Collector Certification

No./ 10002204D

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CERTIFICATION HOLDER:	**EVALUATION SUBJECT**	
Alternate Energy Technologies, LLC 1345 Energy Cove Court Green Cove Springs, FL 32043 USA www.aetsolar.com	**BRAND:**	Star Lite
	MODEL:	SL-40
	TYPE:	Flat Plate Glazed Liquid Heating Collector

PRODUCT CERTIFICATION SYSTEM:

The ICC-SRCC OG-100 certification program includes evaluation and performance ratings for solar thermal collectors as established in the *ICC-SRCC Rules for Solar Heating & Cooling Product Listing Reports.* The program also includes periodic factory inspections and surveillance of the manufacturer's quality management system.

- **COMPLIANCE WITH STANDARD(S):** *ICC 901/SRCC 100 - 2020, Solar Thermal Collectors Standard*
- **THERMAL PERFORMANCE TEST STANDARD:** *ISO 9806 – 2017*

COLLECTOR SPECIFICATIONS:

The certified collector has the following specifications and performance ratings based on testing by an accredited testing laboratory to the standards listed above.

PEAK POWER RATING (P_{MAX} AT SRC)		**Gross Area**	3.80 m²	40.90 ft²
2,707 W		**Length**	3.10 m²	10.2 ft
		Width	1.22 m	4.0 ft
Intercept ($\eta_{0,hem}$)	0.709	**Empty Weight**	59.5 kg	131.2 lb
Slope (a_1)	6.801 W/(m²K)	**Fluid Capacity**	4.5 L	1.2 gal
Test Flowrate (water)	0.023 kg/(m²s)	**Max Design Temp.**	80 °C	176 °F
OG-100 Clear C Rating	10.69 kWh (36.48 kBTU)	**Max Design Pressure**	1103 kPa	160 psi
Fluid(s)	Water, Glycol			

**Intercept and slope values provided based on inlet temperature T_i, and linearized efficiency equation.*

IDENTIFICATION:

Certified collectors must be labeled in accordance with the *ICC-SRCC Rules for Certification Mark and Certificate Use*. Labels must contain the information specified in the standard listed above. Only collectors certified by SRCC under the OG-100 program are eligible to display the OG-100 certification mark.

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THERMAL EFFICIENCY PERFORMANCE:

The efficiency of solar thermal collectors is determined using test methods set in ICC 901/SRCC 100, based on ISO 9806 procedures. Results are processed to provide unique performance coefficients efficiency equations. Simplified linear coefficients $\eta_{0,hem}$ (intercept) and a_1 (slope) using the inlet temperature are provided on the first page. The generalized performance coefficients using mean temperature are provided below.

GENERAL THERMAL PERFORMANCE COEFFICIENTS (ISO 9806-2017, T_m, A_G)*

$$\dot{Q} = A_G(\eta_{0,b}K_b(\theta_L,\theta_T)G_b + \eta_{0,b}K_dG_d - a_1(T_m - T_a) - a_2(T_m - T_a)^2 - a_3u'(T_m - T_a) + a_4(E_L - \sigma T_a^4) - a_5\left(\frac{dT_m}{dt}\right) - a_6u'G - a_7u'(E_L - \sigma T_a^4) - a_8(T_m - T_a)^4$$

T_m: Average temperature of the fluid within the collector (between the inlet and outlet).
T_a: Temperature of the ambient air around the collector.
G: Hemispherical solar irradiance. Sub-types include beam (b) and diffuse (d) irradiance.
E_L: Longwave (infrared) irradiance.

$\eta_{0,hem}$	$\eta_{0,b}$	K_d	a_1	a_2	a_3	a_4	a_5	a_6	a_8
0.712	0.733	0.814	4.775	0.034	0.000	0.000	5269	0.000	0.000
-	-	-	W/(m²K)	W/(m²K²)		J/(m³K)	J/(m²K)	s/m	W/(m²K⁴)

** General thermal efficiency equation for mean (T_m) fluid temperature provided in accordance with ISO 9806-2017. Where data measured using a standard other than ISO 9806-2017, additional assumptions may be applied to determine extended equation coefficients. Reduced surrounding air speed (u') is defined as u'=u-3 m/s. See ISO 9806-2017 for other coefficient definitions.*

OG-100 THERMAL PERFORMANCE RATINGS:

ICC-SRCC OG-100 thermal performance ratings provided for the collector are calculated for a 24-hour period using OG-100 standard conditions using collector parameters measured through laboratory testing. Actual performance will vary with local conditions, installation details and usage.

OG-100 STANDARD DAILY COLLECTOR ENERGY PRODUCTION

Kilowatt-hours (thermal) per Collector per Day				Thousands of BTU per Collector per Day			
Climate → **Category** (T_i-T_a)	Clear (6.3 kWh/m²•day)	Partly Cloudy (4.7 kWh/m²•day)	Overcast (3.1 kWh/m²•day)	**Climate →** **Category** (T_i-T_a)	Clear (2 kBTU/ft²•day)	Partly Cloudy (1.5 kBTU/ft²•day)	Low Radiation (1 kBTU/ft²•day)
A (-5˚C)	16.11	12.27	8.45	**A (-9˚F)**	54.97	41.85	28.84
B (5˚C)	13.92	10.08	6.27	**B (9˚F)**	47.49	34.39	21.39
C (20˚C)	10.69	6.92	3.35	**C (36˚F)**	36.48	23.61	11.44
D (60˚C)	4.51	1.53	0.00	**D (90˚F)**	15.39	5.22	0.00
E (80˚C)	0.14	0.00	0.00	**E (144˚F)**	0.48	0.00	0.00

A – Pool Heating (Warm Climate) **B** – Pool Heating (Cool Climate) **C** – Water Heating (Warm Climate) **D** – Space & Water Heating (Cool Climate) **E** – Commercial Hot Water & Cooling

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IDENTIFICATION:

Certified systems must be identified with the OG-100 certification mark below in accordance with the *Rules for Certification Mark and Certificate Use* and labeled in with the information below per *ICC 901/SRCC 100*:

1. Manufacturer's name and model number.
2. OG-100 collector certification number
3. Maximum operating pressure
4. Dry weight
5. Fluid volume
6. Compatible heat transfer fluids
7. Standard stagnation temperature
8. Year of manufacture and/or serial number.

CONDITIONS:

1. Collector must be installed and operated in accordance with the manufacturer's published instructions and local codes and regulations.
2. OG-100 Standard Performance Ratings and Standard Collector Power Output have been calculated for the tested components using standardized conditions established by the OG-100 program and associated test standards. Actual performance will vary based on the specific usage, installation and local environmental conditions.
3. The collector listed in this ICC-SRCC OG-100 certification must be labeled in accordance with the *ICC-SRCC Rules for Mark and Certificate Use*.
4. OG-100 certifications do not include mounting hardware and fixtures.
5. Solar thermal collectors and mounting hardware and appurtenances must comply with all applicable local requirements for fire resistance. Solar thermal collectors must be mounted in accordance with the requirements of the collector and mounting hardware manufacturers to comply with local codes for structural loading for wind, seismic, snow and other loads.
6. Solar thermal collectors must be used with the heat transfer fluids listed in this document.
7. Solar thermal collector manufactured under a quality control program subject to periodic evaluation in accordance with the requirements of ICC-SRCC.
8. This document must be reproduced in its entirety.
9. Certification status should be confirmed on the ICC-SRCC Directory at www.solar-rating.org

Vincent Chui, S.E.
VP of Evaluation Services

A2LA ACCREDITED
CERTIFICATE # 3299.01, 3299.03

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