



CERTIFIED SOLAR COLLECTOR

SUPPLIER:
1st Sunflower Renewable Energy Co., Ltd
 No.1, HongxiRoad
 Niutang Industrial District
 Changzhou, JIANGSU 213163 China
 www.sunflower-solar.com

BRAND: Soflower
 MODEL: SF-B225818
 COLLECTOR TYPE: Tubular
 CERTIFICATION #: 2008006E
 Original Certification: May 24, 2011
 Expiration Date: September 10, 2022

The solar collector listed below has been evaluated by the Solar Rating & Certification Corporation™ (SRCC™) in accordance with SRCC OG-100, Operating Guidelines and Minimum Standards for Certifying Solar Collectors, and has been certified by the SRCC. This award of certification is subject to all terms and conditions of the Program Agreement and the documents incorporated therein by reference.

| COLLECTOR THERMAL PERFORMANCE RATING | | | | | | | |
|--|---|---|--|------------------------------------|---|---|--|
| Kilowatt-hours (thermal) Per Panel Per Day | | | | Thousands of Btu Per Panel Per Day | | | |
| Climate -> Category (Ti-Ta) | High Radiation (6.3 kWh/m ² .day) | Medium Radiation (4.7 kWh/m ² .day) | Low Radiation (3.1 kWh/m ² .day) | Climate -> Category (Ti-Ta) | High Radiation (2000 Btu/ft ² .day) | Medium Radiation (1500 Btu/ft ² .day) | Low Radiation (1000 Btu/ft ² .day) |
| A (-5 °C) | 8.8 | 6.6 | 4.5 | A (-9 °F) | 29.9 | 22.7 | 15.4 |
| B (5 °C) | 8.3 | 6.2 | 4.1 | B (9 °F) | 28.5 | 21.2 | 13.9 |
| C (20 °C) | 7.7 | 5.5 | 3.4 | C (36 °F) | 26.2 | 18.9 | 11.6 |
| D (50 °C) | 6.3 | 4.2 | 2.2 | D (90 °F) | 21.5 | 14.4 | 7.3 |
| E (80 °C) | 4.9 | 2.8 | 1.0 | E (144 °F) | 16.7 | 9.6 | 3.4 |

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

| COLLECTOR SPECIFICATIONS | | | | | |
|---------------------------|----------------------|-----------------------|------------------------|-----------|---------|
| Gross Area: | 3.349 m ² | 36.05 ft ² | Dry Weight: | 81 kg | 179 lb |
| Net Aperture Area: | 2.078 m ² | 22.37 ft ² | Fluid Capacity: | 1.3 liter | 0.3 gal |
| Absorber Area: | 1.783 m ² | 19.19 ft ² | Test Pressure: | 900 kPa | 131 psi |

| TECHNICAL INFORMATION | | | Tested in accordance with: | | |
|--|--|---------------------|----------------------------|---------------|-----------------------------------|
| ISO Efficiency Equation [NOTE: Based on gross area and (P)=Ti-Ta] | | | | | |
| SI UNITS: | $\eta = 0.363 - 1.15130 \cdot (P)/G - 0.00306 \cdot (P)^2/G$ | Y Intercept: | 0.365 | Slope: | -1.361 W/m ² .°C |
| IP UNITS: | $\eta = 0.363 - 0.20291 \cdot (P)/G - 0.00030 \cdot (P)^2/G$ | Y Intercept: | 0.365 | Slope: | -0.240 Btu/hr.ft ² .°F |

| Transverse Incident Angle Modifier | | | | | | | | Longitudinal Incident Angle Modifier at 50°: | | |
|------------------------------------|------|------|------|------|------|------|------|--|-------------------------------|-------------------------------|
| θ | 10 | 20 | 30 | 40 | 50 | 60 | 70 | Test Fluid: | Water | |
| K$\tau\alpha$ | 1.01 | 1.04 | 1.10 | 1.19 | 1.31 | 1.45 | 1.40 | Test Mass Flow Rate: | 0.0088 kg/(s m ²) | 6.49 lb/(hr ft ²) |

REMARKS:

Jen Higgins

Technical Director





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| ADDITIONAL INFORMATION (click here to return to the rating page) | | | |
|--|---|-------------------|--------------------|
| Test Lab: | Forschungs- und Testzentrum für Solaranlagen (TZS) am Institut für Thermodynamik und Wärmetechnik (ITW) der Universität Stuttgart | Test Report Date: | September 10, 2010 |
| Test Report Number: | | Test conducted: | |

| SOLAR COLLECTOR CONSTRUCTION DETAILS | | | | | |
|--------------------------------------|---------|--------------|---------|--------------|--|
| Header Enclosure: | | | | | |
| Gross Length: | 1.970 m | Gross Width: | 1.700 m | Gross Depth: | |
| Tube Bank: | | | | | |
| Gross Length: | | Gross Width: | | | |

| COLLECTOR MATERIALS | | | | | |
|-----------------------|------------|------------------------|----------|------------------|---|
| Outer Cover: | Glass Tube | Enclosure back: | Aluminum | Back Insulation: | , |
| Inner Cover: | None | Enclosure side: | Aluminum | Side Insulation: | , |
| Absorber Description: | | Flow Pattern: | | | |
| Riser Tube: | Copper | Fin: | | | |
| Absorber Coating: | Selective | Tube to fin connection | | | |

| Glazing | Outer Cover | Inner Cover |
|--|---------------|---------------------|
| Material: | Glass Tube | None |
| Surface Characteristics: | | |
| Thickness: | 1.6 mm | N/A |
| Transmissivity: | | |
| Gross Tube Length (uninstalled): | 1.724 m | |
| Diameter: | 1.276 m | |
| Tube Glazing to Header Enclosure Seal: | Silicone bead | |
| Reflector Shape: | | Reflector Material: |

ABSORBER:





| | | | | | |
|---------------------------|--------|------------------------------------|---------|----------------------------|--------|
| Header Material: | | Header OD: | | Header Wall: | |
| Riser Tube Material: | Copper | Riser Tube OD: | | Riser Tube Wall Thickness: | |
| Fin Material: | | Fin Thickness: | 0.15 mm | | |
| Flow Pattern: | | Number of Flow Tubes / Heat Pipes: | 22 | Tube / Heat Pipe Spacing: | |
| Number of absorber tubes: | 22 | Flow Tube to Fin Bond: | | Length of Flow Path: | 1.75 m |
| Length of Flow Path: | 1.75 m | Riser to Fin/Plate Bond: | | | |

| INSULATION: | | | | | |
|------------------------------|--------------------|-----------|----------------------|------|-----------|
| Location | Type | Thickness | Location | Type | Thickness |
| Back – Top Layer: | | | Sides – Inner Layer: | | |
| Back – Bottom Layer: | | | Sides – Outer Layer: | | |
| Enclosure Fastening Methods: | Mechanical Forming | | Header Enclosure: | | |

| Power Output per Collector(W) [Ti-Ta, G = 1000 W/m ²] | | | | |
|---|----|----|----|----|
| 0 | 10 | 30 | 50 | 70 |
| | | | | |

| PRESSURE DROP | | | | |
|---------------|------------|--|------|---------------------|
| Flow | ΔP | | Flow | ΔP |
| ml/s | Pa | | gpm | in H ₂ O |
| 20 | | | 0.32 | |
| 50 | | | 0.79 | |
| 80 | | | 1.27 | |

