

SUMMARY INFORMATION SHEET

FLORIDA SOLAR ENERGY CENTER

1679 CLEARLAKE ROAD, COCOA, FLORIDA 32922-5703 (321) 638-1000



November 2001
FSEC # 00030

MANUFACTURER

ACR Solar International Corp.
5840 Gibbons Dr., Suite G
Carmichael, California 95608

Revised December 2005

Collector Model

Skyline 20-01

This solar collector was tested by the Florida Solar Energy Center (FSEC) in accordance with prescribed methods and was found to meet the minimum standards established by FSEC. The purpose of the tests is to verify initial performance conditions and quality of construction only. The resulting certification is not a guarantee of long term performance or durability.

DESCRIPTION

Gross Length	3.658 meters	12.00 feet
Gross Width	0.510 meters	1.67 feet
Gross Depth	0.076 meters	0.25 feet
Gross Area	1.865 square meters	20.07 square feet
Transparent Frontal Area	1.720 square meters	18.52 square feet
Volumetric Capacity	1.8 liters	0.5 gallons
Weight (empty)	17.2 kilograms	38.0 pounds
Recommended Flow Rate	34 ml/s	0.5 gpm
Test Pressure	1103 kPag	160 psig
Maximum Wind Load	2394 Pa	50 psf
Number of Cover Plates	One	
Flow Pattern	Series	Forced circulation
Number of Flow Tubes	Four	

MATERIALS

Enclosure	Aluminum frame, aluminum back
Glazing	Two layer extruded polycarbonate sheet, 0.63 cm thick
Absorber	Copper tubes welded to copper fins
Absorber Coating	Selective coating
Insulation	Polyisocyanurate, 2.5 cm thick

THERMAL PERFORMANCE

Tested per ASHRAE 93-1986

$$\text{Incident Angle Modifier } K_{\tau\alpha} = 1.0 - 0.21 \left(\frac{1}{\cos\theta} - 1 \right)$$

Test Flow Rate 34 ml/s 0.54 gpm

Efficiency Equations

$$\eta = 60.4 - 373 (T_i - T_a)/I$$

$$\eta = 60.4 - 66 (T_i - T_a)/I$$

$$\eta = 60.6 - 393 (T_i - T_a)/I + 305 [(T_i - T_a)/I]^2$$

$$\eta = 60.6 - 69 (T_i - T_a)/I + 10 (T_i - T_a)/I^2$$

Units of $(T_i - T_a)/I$ are $^{\circ}\text{C} / \text{Watt}/\text{m}^2$

Units of $(T_i - T_a)/I$ are $^{\circ}\text{F} / \text{Btu}/\text{hr}\cdot\text{ft}^2$

RATING

The collector has been rated for energy output on measured performance and an assumed standard day. Total solar energy available for the standard day is 5045 Watt-hours/m² (1600 Btu/ft²) distributed over a 10 hour period.

Output energy ratings for this collector based on the second-order efficiency curve are:

Collector Temperature	Energy Output	
Low Temperature, 35°C (95°F)	19,000 Kilojoules/day	18,100 Btu/day
Intermediate Temperature, 50°C (122°F)	15,600 Kilojoules/day	14,800 Btu/day
High Temperature, 100°C (212°F)	7,000 Kilojoules/day	6,600 Btu/day

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1679 CLEARLAKE ROAD, COCOA, FLORIDA 32922-5703 (321) 638-1000



December 2005
FSEC # 00212C

MANUFACTURER

ACR Solar International Corp.
5840 Gibbons Dr., Suite G
Carmichael, California 95608

Collector Model

Skyline 10-01

This solar collector was evaluated by the Florida Solar Energy Center (FSEC) in accordance with prescribed methods and was found to meet the minimum standards established by FSEC. This evaluation was based on solar collector tests performed at the Florida Solar Energy Center, Cocoa, Florida. The purpose of the tests is to verify initial performance conditions and quality of construction only. The resulting certification is not a guarantee of long term performance or durability.

DESCRIPTION

Gross Length	1.829 meters	6.00 feet
Gross Width	0.508 meters	1.67 feet
Gross Depth	0.076 meters	0.25 feet
Gross Area	0.929 square meters	10.00 square feet
Transparent Frontal Area	0.870 square meters	9.37 square feet
Volumetric Capacity	0.8 liters	0.2 gallons
Weight (empty)	8.6 kilograms	19.0 pounds
Recommended Flow Rate	25 ml/s	0.4 gpm
Test Pressure	1103 kPag	160 psig
Number of Cover Plates	One	
Flow Pattern	Series	Forced circulation
Number of Flow Tubes	Four	

MATERIALS

Enclosure	Aluminum frame, aluminum back
Glazing	Two layer extruded polycarbonate sheet, 0.63 cm thick
Absorber	Copper tubes welded to copper fins
Absorber Coating	Selective coating
Insulation	Polyisocyanurate, 2.5 cm thick

THERMAL PERFORMANCE

Tested per ASHRAE 93-1986

$$\text{Incident Angle Modifier} \quad K_{\tau\alpha} = 1.0 - 0.21 \left(\frac{1}{\cos\theta} - 1 \right)$$

Efficiency Equations

$$\eta = 61.4 - 379 (T_i - T_a)/I \qquad \eta = 61.4 - 67 (T_i - T_a)/I$$

$$\eta = 61.5 - 399 (T_i - T_a)/I + 310 [(T_i - T_a)/I]^2 \qquad \eta = 61.5 - 70 (T_i - T_a)/I + 10 (T_i - T_a)/I^2$$

Units of $(T_i - T_a)/I$ are °C / Watt/m²

Units of $(T_i - T_a)/I$ are °F / Btu/hr•ft²

RATING

The collector has been rated for energy output on measured performance and an assumed standard day. Total solar energy available for the standard day is 5045 Watt-hours/m² (1600 Btu/ft²) distributed over a 10 hour period.

Output energy ratings for this collector based on the second-order efficiency curve are:

Collector Temperature	Energy Output	
Low Temperature, 35°C (95°F)	9,600 Kilojoules/day	9,100 Btu/day
Intermediate Temperature, 50°C (122°F)	7,900 Kilojoules/day	7,500 Btu/day
High Temperature, 100°C (212°F)	3,500 Kilojoules/day	3,400 Btu/day

Reference 00030