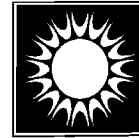


# SUMMARY INFORMATION SHEET

## FLORIDA SOLAR ENERGY CENTER

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



November 2002  
FSEC # 00090N

### MANUFACTURER

Alternate Energy Technologies, LLC  
1057 N. Ellis Road, Unit 4  
Jacksonville, Florida 32254

### Collector Model

AE-40

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 Bodycote Materials Testing Canada Inc., Mississauga, Ontario, Canada. 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	3.080 meters	10.10 feet
Gross Width	1.200 meters	3.94 feet
Gross Depth	0.079 meters	0.26 feet
Gross Area	3.697 square meters	39.79 square feet
Transparent Frontal Area	3.482 square meters	37.48 square feet
Volumetric Capacity	6.1 liters	1.6 gallons
Weight (empty)	66.7 kilograms	147.0 pounds
Recommended Flow Rate	76 ml/s	1.2 gpm
Test Pressure	1103 kPag	160 psig
Number of Cover Plates	One	
Flow Pattern	Parallel	Forced Circulation
Number of Flow Tubes	Ten	

### MATERIALS

Enclosure	Aluminum frame, aluminum back
Glazing	Tempered low iron glass, 0.40 cm thick
Absorber	Copper tubes welded to copper fins
Absorber Coating	Selective coating
Insulation	Foil faced polyisocyanurate, 3.2 cm thick

### THERMAL PERFORMANCE

Tested per ASHRAE 93-1986

Incident Angle Modifier  $\tau\alpha = 1.0 - 0.19 \left( \frac{1}{\cos\theta} - 1 \right)$

Efficiency Equations

$$\eta = 72.0 - 501 (Ti-Ta)/I$$

$$\eta = 72.0 - 88 (Ti-Ta)/I$$

$$\eta = 70.4 - 346 (Ti-Ta)/I - 1605 [(Ti-Ta)/I]^2$$

$$\eta = 70.4 - 61 (Ti-Ta)/I - 50 [(Ti-Ta)/I]^2$$

Units of (Ti-Ta)/I are °C / Watt/m<sup>2</sup>

Units of (Ti-Ta)/I are °F / Btu/hr•ft<sup>2</sup>

### 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/m<sup>2</sup> (1600 Btu/ft<sup>2</sup>) 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)	44,300 Kilojoules/day	42,000 Btu/day
Intermediate Temperature, 50°C (122°F)	36,300 Kilojoules/day	34,400 Btu/day
High Temperature, 100°C (212°F)	12,200 Kilojoules/day	11,600 Btu/day

REFERENCE 00081N