

SUMMARY INFORMATION SHEET

FLORIDA SOLAR ENERGY CENTER®

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



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FSEC # 00215N

MANUFACTURER

Revised October 2007

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

Collector Model

MSC-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	3.096 meters	10.16 feet
Gross Width	1.216 meters	3.99 feet
Gross Depth	0.079 meters	0.26 feet
Gross Area	3.764 square meters	40.52 square feet
Transparent Frontal Area	3.428 square meters	36.90 square feet
Volumetric Capacity	4.6 liters	1.2 gallons
Weight (empty)	71.2 kilograms	157.0 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 $K_{\tau\alpha} = 1.0 - 0.19 \left(\frac{1}{\cos\theta} - 1 \right)$

Efficiency Equations

$$\eta = 69.6 - 484 (T_i - T_a) / I$$

$$\eta = 69.6 - 85 (T_i - T_a) / I$$

$$\eta = 68.1 - 334 (T_i - T_a) / I - 1552 [(T_i - T_a) / I]^2$$

$$\eta = 68.1 - 58 (T_i - T_a) / I - 48 [(T_i - T_a) / I]^2$$

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)	43,600 Kilojoules/day	41,300 Btu/day
Intermediate Temperature, 50°C (122°F)	35,800 Kilojoules/day	33,900 Btu/day
High Temperature, 100°C (212°F)	12,000 Kilojoules/day	11,400 Btu/day

REFERENCE 00081N