

SUMMARY INFORMATION SHEET

FLORIDA SOLAR ENERGY CENTER®

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



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FSEC # 00213N

MANUFACTURER

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

Collector Model

MSC-21

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	2.185 meters	7.17 feet
Gross Width	0.914 meters	3.00 feet
Gross Depth	0.079 meters	0.26 feet
Gross Area	1.998 square meters	21.50 square feet
Transparent Frontal Area	1.761 square meters	18.95 square feet
Volumetric Capacity	3.0 liters	0.8 gallons
Weight (empty)	37.2 kilograms	82.0 pounds
Recommended Flow Rate	63 ml/s	1.0 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, 0.30 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

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

Efficiency Equations

$$\eta = 67.4 - 469 (T_i - T_a)/I$$

$$\eta = 67.4 - 83 (T_i - T_a)/I$$

$$\eta = 65.9 - 324 (T_i - T_a)/I - 1502 [(T_i - T_a)/I]^2$$

$$\eta = 65.9 - 57 (T_i - T_a)/I - 47 [(T_i - T_a)/I]^2$$

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)	22,400 Kilojoules/day	21,200 Btu/day
Intermediate Temperature, 50°C (122°F)	18,400 Kilojoules/day	17,400 Btu/day
High Temperature, 100°C (212°F)	6,200 Kilojoules/day	5,800 Btu/day

REFERENCE 00081N