

SOLAR COLLECTOR
CERTIFICATION



CERTIFIED SOLAR COLLECTOR

SUPPLIER: **Solartron Energy Systems Inc.**
1328 Highway #6
Amherst, NS, B4H3Y2, Canada
MODEL: SolarBeam SB-4.5-4400
COLLECTOR TYPE: Concentrating
CERTIFICATION#: 2011034A

Original Certification Date: 19-Aug-11

COLLECTOR SPECIFICATIONS (for the tested collector)

Gross Area	15.90 m ²	171.15 ft ²	Gross Length	4.50 m	14.76 ft
Aperture Area	15.80 m ²	170.07 ft ²	Gross Width	4.50 m	14.76 ft
Absorber Area	0.0645 m ²	0.69 ft ²	Gross Depth	2.845 m	9.33 ft
Fluid Capacity	0.303 liter	0.08 gal	Test Pressure	258 kPa	37.5 psi
Dry Weight	436 kg	961 lb	Concentration Ratio	246	
Tracking: two axis			Control System: active		
Cover Geometry: none			Reflector Geometry: parabolic		

COLLECTOR MATERIALS and COATINGS

Cover: none	Reflector: anodized aluminum
Absorber: aluminum block with integrated flow passages	Absorber Coating: silica-ceramic coating

TECHNICAL INFORMATION

Collector Model: (Based on Aperture Area)

$$Q/A_a = F'(\tau\alpha)_{en} K_{\Theta b}(\Theta) G_b + F'(\tau\alpha)_{en} K_{\Theta d}(\Theta) G_d - c_1(t_m - t_a) - c_2(t_m - t_a)^2 - c_3 u(t_m - t_a) + c_4(E_L - \sigma t_a^4) - c_5 dt_m/dt - c_6 uG$$

$$K(\Theta) = 1 - b_o [1/\cos(\Theta) - 1]$$

Collector efficiency factor: $F'(\tau\alpha)_{en}$	0.729	
Incident angle modifier for diffuse radiation: $K_{\Theta d}$	-	
Longitudinal incident angle modifier constant: b_{0L}	-	
Transverse incident angle modifier constant: b_{0T}	-	
Heat loss coefficient: c_1	0.733	[W/(m ² K)]
Temperature dependence of the heat loss coefficient: c_2	0.0204	[W/(m ² K ²)]
Wind speed dependence of the heat loss coefficient: c_3	0.00	[J/(m ³ K)]
Sky temperature loss coefficient: c_4	0.00	[W/(m ² K)]
Effective thermal capacity: c_5	253	[J/(m ² K)]
Wind dependence of zero-loss efficiency: c_6	0.085	[s/m]

IAM	10°	20°	30°	40°	50°	60°	70°
$K_{\Theta T}(\Theta_T)$							
$K_{\Theta L}(\Theta_L)$							

Impact Safety Rating: 0

Test Conditions:

Max Fluid Temperature During Efficiency Test: 84 °C	Wind Speed Range During Efficiency Test: 1.0 to 4.0 m/s
Test Fluid: water	Test Flow Rate: 0.270 kg/sec
Exposure Test Conducted: wet	Test Method: SRCC Standard 600

Remarks: