CSA INTERNATIONAL

Certificate of Verification

Certificate: 2464328

Project: 2464328

Master Contract: 254218

Date Issued: 2011/10/14

Issued to: **SolarTron Energy Systems Inc.**
1328 Highway 6
Amherst, NS, B4H 3Y2
Canada

Attention: Mr. Edward Herniak

The Product listed below are eligible to bear the CSA EEV Mark shown

VERIFIED
CSA
Energy
Performance
Rendement
Énergétique
VÉRIFIÉ
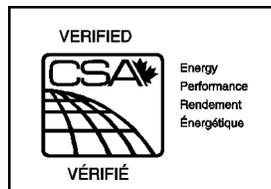
Issued by: Babu Patel

PRODUCTS

Class 8854-02 – VERIFICATION OF SOLAR CONCENTRATING COLLECTORS- Verification Listing of Solar Concentrating Collectors to Requirements of SRCC Standard 600

Solar Concentrating Collector Model: Solar Beam SB-4.5-4400; Unglazed, parabolic reflector, two axis tracking, active control system, 25 psi max operating pressure, 93 ^{0}C max temperature.

Gross Physical Dimension	Gross Area (m^2)	Aperture Area (m^2)	Absorber Area (m^2)	Concentration ratio of Absorber to dish	Max. Operating Pressure
4.5m L x 4.5m W x 2.845m D	15.90	15.80	0.0645	246:1	25 psi

Coefficients	Value
Collector Efficiency Factor - F'(τα)en	0.729
Heat loss coefficient: c1	0.733 [W/(m^{2}K)]
Temperature dependence of the heat loss coefficient: c2	0.0204 [W/(m^{2}K2)]
Wind speed dependence of the heat loss coefficient: c3	3.36 [J/(m^{3}K)]
Sky temperature dependence of the heat loss coefficient: c4	0.163 [W/(m^{2}K)]
Effective Thermal Capacity: c5	253 [J/(m^{2}K)]
Wind dependence in the zero-loss efficiency: c6	0.085 [s/m]

Equation used for test results:

$$Q/A_a = G_b \times F'(\tau\alpha)en\ K\theta b + G_d \times F'(\tau\alpha)en\ K\theta d - c6uG^* - c1x\ (tm\text{-}ta) - c2x\ (tm\text{-}ta)^2 - c5\ dtm/dt$$

Power output per Collector unit (W)

Tm-Ta in K	Solar Irradiance G		
	400 W/m^2	**700 W/m^2**	**1000 W/m^2**
0			11518
10	4598	8053	11509
30	4567	8022	11478
50	4519	7975	11430

Power output Peak = 11518 (W) at 1000 W/m^2

APPLICABLE REQUIREMENTS

SRCC Standard 600 – Test methods and minimum standards for certifying solar concentrating collectors